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ONTARIO.

AGRICULTURAL COMMISSION. 188

[Report of the Commissioners
and

G to J
APPENDICES (C TO S)

INCLUSIVE,

CONTAINING EVIDENCE TAKEN BY THE COMMISSIONERS, SPECIAL
REPORTS, ETC.,

IN

VOLS. III., IV. AND V.

VOL. IV.

(APPENDICES G TO J.)

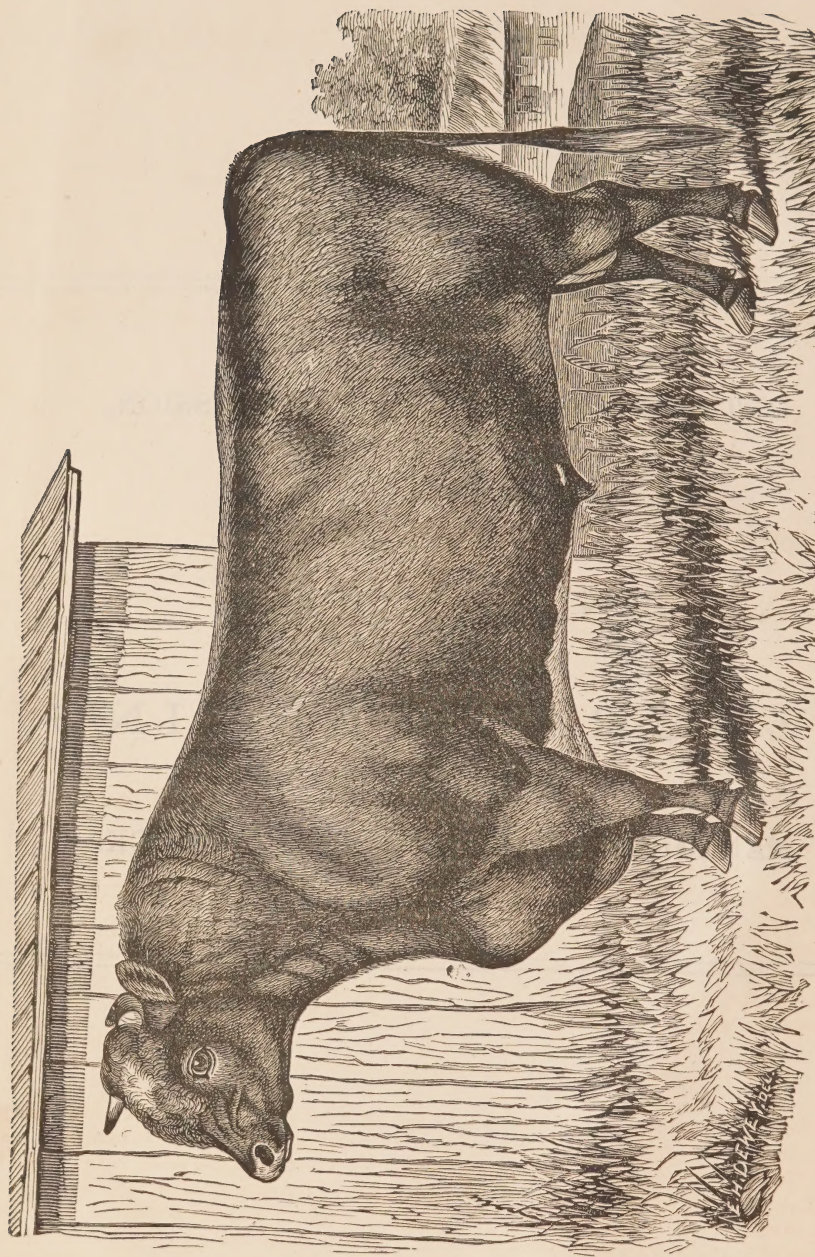


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PURE SHORTHORN BULL.

THE LIVERPOOL JOURNAL

ONTARIO AGRICULTURAL COMMISSION.

APPENDIX G.

EVIDENCE

RELATING TO

GENERAL FARMING,

AND

MANAGEMENT OF CROPS AND STOCK.

Sittings to take oral evidence, held at Toronto, June 22nd and 23rd, 1880. *Present:* Mr. JOHN DRYDEN, M.P.P., Chairman; Hon. S. C. WOOD, R. GIBSON, A. H. DYMOND, J. P. WISER, M.P.; T. BALLANTYNE, M.P.P.; THOMAS STOCK, WILLIAM WHITELOW, J. P. McMILLAN, A. WILSON, EDWARD BYRNE and FRANCIS MALCOLM.

MR. CLAY'S EVIDENCE.

JOHN CLAY, JR., was called and examined.

BOW PARK FARM.

To Mr. Dryden.—I have been connected with the Bow Park Association for four years, and have been manager of the farm for the past year. I have had considerable experience in the old country as an agriculturist in addition. Last year I travelled over a great part of America with Messrs. Read and Pell as a Commissioner with them for the British Government. At Bow Park there are 900 acres of land upon which a system of mixed husbandry has been carried on. We have sold our horses and sheep, and are going to devote our whole attention to the breeding and raising of Shorthorns. We have had in the past on the farm a considerable number of horses, sheep and pigs. We have about two hundred pure-bred female Shorthorns, and about fifty bulls.

SOILING AND GRAZING COMBINED.

Previous to the present time we have in the care of our stock chiefly followed the soiling system, but we are gradually changing into grazing during the summer months. I think the best system that could be followed would be to combine the two; because at Bow Park we have a large number of breeding animals and it is necessary that they should have moderate exercise, and they can never get exercise so easily and so beneficially as when they are seeking their food in the fields. The difficulty with the grazing system is that the pasture dries up in the summer time, so that it is well to have some green succulent food to feed them with. I believe there is no soil so well fitted for feeding that kind of stock as the Canadian soil.

[*Mr. Clay.*]

ROTATION OF CROPS.

In the rotation of crops you would first get rye—I don't put very much faith in it, except as a very early crop. Then would follow red clover or lucerne or some such crop. Then you could grow oats and peas and tares; and then you could fall back either on clover or Indian corn, which grows very largely in any part of the country. I believe there are various other crops which could be brought into use, but I am only giving the actual result of my own experience. I have seen prickly comfrey used with success; you can grow it early and cut it very frequently, but it is a very uncertain crop, and needs to be very carefully tended or it may not grow at all. I have seen it frequently in England, but I have never known it to be tested here. Indian corn, I believe, is on the whole the most suitable crop for this country; it is amply sufficient to carry the cattle through most part of the summer time. We have found that tares won't grow at Bow Park. I give the cattle their fodder chiefly in boxes in the fields. If it gets hard I put it through the chaff cutter. But our bull calves and the cows that are pregnant have to be kept inside.

THOROUGHBRED MALES INDISPENSABLE.

My opinion is most decided that if we want to produce a good stock of cattle in this country, we must use nothing but thoroughbred males. I mean by thoroughbred an animal that is entitled to be entered in the herd book—that has four or five crosses of pure blood, though I would certainly go further than simply to find an animal with a pedigree; I would expect some merit in the individual animal itself. You will sometimes find a grade as good in every respect as a thoroughbred, but it has not the impressive power of a pure-bred animal. I believe it will not pay our farmers throughout the country to go into the breeding of thoroughbred stock. It is a business entirely by itself, and it is impossible to carry it on successfully on a small scale. It is likely that the breeding of pure-bred animals will drift into fewer hands and into hands of men who thoroughly understand the business. I think it would be greatly for the benefit of Ontario if the ordinary farmers were to go more extensively into the raising of stock.

TREATMENT OF CALVES.

At Bow Park we aim to have our calves dropped during the fall and winter; we begin about the first of September and have the bulk of the calving over by June, so that there are not many coming in the hot weather. We allow the calves to follow their dams, and if the dam is not very valuable we allow her to bring up her own calf. But in the case of very valuable animals we get a foster mother and allow her to milk the calves for two or three months, and then wean them. We dry off the mother; but some cows have to bring up their own calves, because we cannot keep them dry. We do not usually milk the cows down very lean. This has had no effect upon the milking properties of the produce, because as soon as you use the bull on common cattle their milking qualities come back. We keep the calves in boxes along with their foster mothers. In the summer time we turn them out all night, but in the winter they get exercise through the day. In the case of very valuable animals we let them suck as long as they will do so; they generally stop sucking about nine or ten months old; but usually we wean our calves at six or seven months old. If we can take the usage of the farmers in the neighbourhood of Bow Park as an example of what prevails all over Ontario, I think the way the farmers keep their cattle is a disgrace to any farming country. They do not afford them food and shelter enough to keep them in a healthy condition. If an animal gets plenty of food it will generally be able to shelter itself; but, unfortunately, there is a general want of both. The greatest injury in this respect is done, I believe, to a calf before it is six months old, as at that age a great many calves stop sucking and will keep themselves. After they are weaned we feed our calves largely on grain. We have been in the habit of giving them a little linseed cake, and during the last year or so we have been using it more exclusively.

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I think there is a happy medium where, without feeding too much, you can keep calves in good condition. Our bulls we have to treat a little more liberally, in order to keep them in fine condition. I would allow the calves to run loose. I would run heifers loose altogether. Bulls are very apt to injure themselves when they get above a certain age if they are allowed to run loose. I would give the calves their grain in separate boxes, if possible, because those that are strong sometimes take advantage of the weaker ones. In the winter time we can do that, but not very easily in the summer time. The bulls I think it is better to feed separately by themselves.

ADVERTISED CATTLE FOODS.

I have not had experience in this country in the feeding of cattle for market, though I have been a large feeder at home. I don't think it profitable to use any of the advertised cattle fodder—I have never used it. I don't think it has ever been used at Bow Park. Some things may have been tried in times past as an experiment; but as a rule there has been none used, and the last two or three years there has certainly been none used. These fodders are evidently a condiment, intended to give an animal a certain degree of false appetite, and it appears to me that if an animal cannot naturally take its food, it is a false system to try and increase its appetite by these artificial means.

ROOT CROP CULTURE—FEEDING.

The principal root crop we grow at Bow Park is mangolds. This year I have 35 acres of the Long Mammoth Red Mangold. It is fair to state that if turnips would grow successfully at Bow Park we would grow them, but it is not suitable land for turnips, while mangolds will grow in great profusion. I think thirty tons of mangolds to the acre is a good crop. In feeding them to cattle we pulp them and mix them with chopped hay or Indian corn or mix in a little bran or meal, and give the cattle some every afternoon. We allow the mangolds to lie a short while after pulping them in order to cause them to ferment a little. They are a very laxative food if they are given immediately; but otherwise they are very beneficial.

BREEDING CATTLE.

We breed our heifers at from sixteen to twenty-two months old; the majority of them are bred between eighteen and twenty months. I do not think that breeding at that age at all retards the growth of the animal, although it depends very much upon the constitution of the animal what effect breeding has upon it. I think it is undesirable to keep breeding cows in high condition. I think there is a medium to be observed there also. I would rather have them in rather high condition than too low. It is well to keep them in pretty good condition. The animals, for instance, that were at the show in Toronto last year have all bred calves since, and every one of them is in calf again. I think all dry feed is prejudicial to breeding. The less grain food you can give to breeding cows the more certain you are of keeping them in good breeding condition. In the winter time you cannot get green feed, but you can have hay and straw, and linseed cake will answer almost as well as green feed.

ABORTION AMONG COWS.

We have very little abortion among our cows, and in going through our stock books we find it becoming very much less. This, I believe, is due to a more sparing use than formerly of rye, which has a most injurious effect upon the breeding qualities of cows. The same applies to Indian corn. It is the ergot which forms on these two grains that makes them specially injurious in that respect. I believe the less you have to do with rye for feeding to cows the better, and the more natural food such as hay and roots you give them, the more certain you will be to have good results. In the month of September you will see

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a fungus—smut—growing on western corn especially, and in that smut there is a large amount of ergot, which has the same effect on cattle as rye. I am going to give up the growth of rye entirely. We have very little difficulty in getting our cows to breed. In our large herd we have not at the present moment six who are not regular breeders. We keep very accurate statistics relating to our stock. We have a breeding list printed every month so that we can tell exactly how the business is going. I attribute our success in breeding to the animals getting plenty of outdoor exercise and being fed on their natural food.

To Mr. Stock.—Redtop may produce abortion, as it flourishes in wet seasons, and in wet seasons in England there is more abortion than in dry seasons. I am not aware that blue grass produces it.

BEEFING CATTLE.

To Mr. Byrne.—In the soiling system I would give the preference to clover. I think the best thoroughbred to mix with our Canadian cattle is the Shorthorn Durham. With three or four crosses you would get very good stock for shipment to England. I should imagine that the most profitable age at which to ship a good grade animal is from thirty to thirty-six months, though if they are properly fed you might get grade animals in good enough condition for shipment at twenty-four months. To produce the best beef in the quickest manner for market I would feed the cattle on good grass, and when the grazing failed give them a good supply of green food with linseed cake and Indian corn; but at the present time the Indian corn, being heavily taxed, it is very hard for feeders to import and use it profitably. I would rely on clover as my principal food. By proper management you could grow considerable clover. You could cut it twice, and then supplement it with corn or lucerne or some other such food.

CORN—PRICKLY COMFREY—OIL CAKE.

To Mr. Malcolm.—The great bulk of the Indian corn which has been used at Bow Park came from the United States. The cattle appear to relish prickly comfrey very much. The amount of oilcake to be given to cattle is all a matter of price. Its average price in this country is \$30 a ton. I think oilcake is a healthier food in every respect than grain. Of the grains I believe oats the most nutritive food you can use. My experience is that a mixture of oilcake and grain is the best food for cattle when they come to a certain age; but at first oilcake is best for young cattle—until they are eight or ten months old. Animals need a good deal of exercise to develop their muscle, and for that reason I would let them run a great deal in the fields. I would not tie them at all when shutting them up at night. I have been told by the best authorities on the subject that the smut upon corn and that upon rye are of the same nature—that they both contain a large amount of ergot. I was led to look into the matter last year through having had an abortion or two among our cattle. It is fair to state that it has been very difficult to find out the cause of abortion; but it is a well-known fact among breeders that rye has a tendency to produce it. I think bran is a very healthy food, though there is not much substance in it. There is no doubt that it is a very good milk producing condiment.

BEEF AND MUTTON FOR ENGLAND.

To Mr. Whitelaw.—A Shorthorn Durham at three years old should weigh over 1,500 pounds. I think from 1,400 pounds is the best weight for shipment to the old country. For the English market I think it is not worth the trouble of our farmers to pay attention to any other breed than the Durham. On a small farm of a hundred or a hundred and fifty acres it is difficult to carry on the soiling system successfully; but on a large farm it would probably be the most profitable system. A small farmer would therefore not be able to compete in the raising of cattle with a man who possessed a large farm and went into the business in a regular way. I don't consider corn superior to peas for

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feeding purposes. The best sheep for the English market is, I think, a cross of the Down sheep—a Shropshire, Hampshire, or Oxford—probably the Oxford. The best sheep for the English market is a small sheep that would weigh about seventy pounds dressed. It would have to weigh about 120 pounds live weight. I know from experience that that is the sheep that will bring the highest price. Some breeds can be brought to that weight at about ten months old, but the Cheviot or the Hill sheep you cannot get to that weight before two years old. There is the question of the cost of export to be considered. The shippers charge no more for a heavy sheep than for a light one, as the rate at present is so much per head. The English market demands a smaller sheep than the Cotswold, and the sheep that dresses at about eighteen pounds to the quarter, or from seventy to seventy-two pounds a carcass, is the sheep that sells for the most money per pound. The Oxford Down is a cross between the Cotswold and the Hampshire. That was not a pure-bred sheep to begin with, but it has been bred so consistently that it now gets the name of being a pure-bred sheep, and the best proof that it is so is that it is used to cross upon animals that are not pure-bred, so as to improve them. The great objection to the South Down is its want of wool. It is an important item to raise a considerable fleece of wool in this country, and the Oxford Down has the fullest fleece of all the Downs.

THE SHORTHORN FIRST.

To Mr. Wiser.—The Highland Scot, I believe, sells for more money per stone in the English market than any other class of cattle, but I would not advise Canadians to attempt to raise it as it does not go into the market until it is four or five years old. The Durhams, on the other hand, are put on the market at from twenty to twenty-four months old. The Polled Angus is a good animal and sells at a very high figure on the English market; but they have never made much progress, and the Canadian farmer will do well to follow the people of England in what they are doing with regard to cattle. The Polled Angus and the Devon and the Highland Scot exist in some districts, but the animal that has spread over the whole of Great Britain as well as over the American continent is the Shorthorn. It is cosmopolitan, and I believe it has a firmer hold on the American continent to-day than it ever had before.

To Mr. McMillan.—I believe in soiling young cattle in the field, and we are making preparations now for doing that. You must give young cattle a certain amount of artificial food in the summer time. In the middle of the day it is perhaps well to bring them in and give them some artificial food such as linseed cake or corn meal or a little bran—whatever is most advantageous. It is very difficult now to sell a bull that is bred from a common cow with three or four crosses. Nearly all the bulls that are sold in this country are from imported cows. Hundreds of imported cows have come into this country and all of the animals we have are from them. I think a man would be making a great mistake if he bought simply a piece of paper—if he merely looked to the pedigree of an animal; he should look to the individual merit of an animal as well. If an animal had not a good person I would not have it, however good a pedigree it had, and if it had not a good pedigree I would not have it at all.

ORIGIN OF THE DURHAM BREED.

To Mr. Wiser.—The combination of blood that produced the Shorthorn has not been discovered. It is supposed that the Shorthorn originated two or three hundred years ago in Teeswater, and those Teeswater cattle were long looked upon as the best race of cattle in England. About the latter end of the eighteenth century the Brothers Colling, among other breeders, took up this class and improved it. The bull to which most of the cattle of the present day owe their superlative merit is one called "Favourite (252)." After the days of the Brothers Colling, and building upon their foundation, came Bates and Booth; and they, by a continuous process of in-breeding, have been able to raise the Shorthorn to its excellence in the present day. There are legends connected with the Shorthorn which it is scarcely of any use to refer to now; a great deal concerning its

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origin is based upon mystery, but it no doubt owes a great deal of its excellence to the Brothers Colling. The system of in-breeding, though producing good results in the case of the Shorthorn, will not do for all animals. I do not say anything about horses; and the principle does not hold good in the human race. Hubback was the bull that originated the family of the Duchesses.

A BETTER HERD BOOK WANTED.

I use the American Herd Book. We have a herd book in Canada, but it has no standing. There is the Kentucky Shorthorn Record, the Ohio Herd Book, the Canada Herd Book, and the American Herd Book. My idea is that they should all be amalgamated into one, and that we should have only one herd book for the American continent as there is only one for England. I would like to have a herd book with a continental reputation. With a herd book that has a good reputation, a farmer can satisfy himself when buying whether he is getting a pure-bred animal or not. If you buy an animal that is registered in the American Herd Book, for instance, you may be satisfied that he is to all intents and purposes a pure Shorthorn, but you may get an animal which is registered in the Canadian Herd Book, and it may be no better than a grade. We want a herd book that puts a stamp upon an animal as reliable. The defect in the Canadian Herd Book is that it admits animals that have only four crosses, while an animal cannot be registered in the American Herd Book unless it can trace its pedigree to an imported cow. The result is that the Canadian Herd Book has not that standing among Shorthorn men that the American has. All our Shorthorns at Bow Park are pure-bred, and every one of them, without exception, is from a cow imported from England. Of course some of the bulls are not from England, but they are bred from imported cows, having a pedigree in the English Herd Book. As to the number of crosses necessary to produce a thoroughbred, some few years ago it was accepted that an animal with five crosses was nearly thoroughbred; but opinions are materially changing on that subject.

RAISING GRADE STOCK.

To Mr. Gibson.—Although we have 200 females at Bow Park, only about 120 are fit to breed, so that we get about 60 bull calves and 60 heifers a year. We have only 40 bulls on hand at this moment, and all but six are under a year old. I think the most profitable time to sell them is when they are from eight to ten months old though as a rule they are sold at from twelve to fifteen months old. I suppose, considering their feed and attention, it would cost \$70 or \$80 to bring them to the age of ten months. The most impressive sires we have just now are what are known as the Duchess sires. They have been bred for nearly one hundred years in a distinct line without having a violent outcross. But I believe that if you put a Shorthorn bull with five or six crosses on a good grade cow, you will get a good steer. If you put a Shorthorn bull upon a common cow, you will raise a very good steer for shipment to England, and every cross after that will be better. I have seen plenty of single cross steers going across to England; and even one cross will make an immense improvement upon the common stock. You will have both larger animals and better quality; you can't sell quantity now unless you have quality along with it. An animal of good quality is worth 20 per cent. more than a poor animal, sometimes 30 per cent. Pure bulls must be used, whether they are Herefords, Shorthorns, or Polled Anguses. If a farmer owning 50 cows bought a pure bull for \$300, he would obtain from 40 to 45 calves in the first year—there would, of course, be some fallow cows—the bull would more than earn his money in the first year.

AMERICAN CATTLE TRADE.

When travelling with Messrs. Pell and Read last summer, I saw an immense number of good steers in the blue grass regions in Kentucky, Indiana and Ohio. The reason the farmers there raise such good stock is that they have been using pure-bred bulls ex-

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clusively. They had large importations in 1817, 1832 and 1834, and on since then, and the benefit of these importations is being reaped to-day in the enormous number of steers these men are able to ship every year to the old country.

CATTLE RAISING AND CATTLE FEEDING.

After considerable study of the matter, I have formed the opinion that the cattle trade of America is likely to develop itself into two distinct lines. I believe the region west of the Mississippi will become an immense cattle-raising region, and that the States east of the Mississippi—Indiana, Illinois and Ohio—and I think Ontario will have to be included—will become great feeding States. I am clearly of opinion that the Province of Ontario, while there will always be some cattle-raising in it, will by and by rise to be a great beef-feeding region. The reason I have formed that opinion is that in most parts of Ontario the soil is getting pretty well worn out, and the only remedy which will bring back the land to its normal condition is the making of farm-yard manure, and the cheapest way to do that is to feed cattle. Another circumstance must be taken into consideration. The Canadian farmer has very little to do during the winter, and the best way he can employ his time then is to feed cattle for the European market. He cannot raise cattle as cheaply as they can be raised on the western prairies, on the gigantic scale on which cattle-raising is carried on there now. I have seen a great deal of ranchmen; some of them I have known to buy 200 bulls this season to take out to the ranches. They can raise cattle very cheaply there—and they are not going to raise cattle only, but they are going to improve the quality of the beef; and they will draft these cattle to the places where they will be fed and prepared for market; and there seems to me a likelihood that the Canadian farmer will be compelled to turn his attention to the feeding of these cattle to send over to the European market. The ranchmen insist on their bulls having a pedigree; some of them buy grades, but they must have four or five crosses. I saw some ranchmen give three or four hundred dollars for bulls this season. The Ontario farmers will be able to buy young cattle cheaply, and after they fatten them they will be able to sell them well. It will take a few years to work its own cure, but it will come, and it will be of immense value to the Ontario farmers.

THE DUTY AN OBSTACLE.

To Mr. Balantyne.—The duty on cattle and corn is an obstacle to this trade, but I am in hopes these days will pass by. With a duty on lean cattle and on corn, the main thing for feeding to them, the Ontario farmer has no chance against the western men. It is impossible for any Canadian farmer to raise cattle and compete against a man upon the ranches. The ranchmen raise them cheaper and better because they are able to go into the business on a larger scale, their land is far cheaper, and they are able to let their cattle run in the open.

PRICE OF BULLS.

To Mr. Wiser.—A bull with four crosses can be bought in the States for from \$75 to \$100. But the general run of the bulls that have gone out to the ranches have a good many more than four crosses in them. They have been paying for bulls as much as \$150, and some of them have gone to the length of \$350. The demand was great this year, because there were few bulls on the market. They like to take out bulls twelve or fifteen months old. At that age they have their constitution formed.

To Mr. Gibson.—I believe the great supply of cattle for the European market will come from the west. Just as we have rotation in crops, we have rotation in breeding and feeding districts, and the lines of demarcation will be more clearly marked in this country than in England. I am convinced that west of the Mississippi will be the great breeding region, and east of the Mississippi the great feeding region. There will be, of

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course, certain districts in Canada where you will be able to breed cattle, but I think you will find that the great bulk of our cattle, if we can get them in without any duty, will come from the Western States. In raising cattle, the object I would keep in view would be to improve the quality. At Bow Park we raise cattle of the high class only to supply breeders. Unless heifers are fed pretty generously I do not think it is possible to get them in breeding condition at sixteen months old—and it depends very much also on the animals themselves.

THE DURHAM FOR BEEF AND DAIRY PURPOSES COMBINED.

To Mr. Dymond.—For the raising of beef, there is no use of paying attention to anything but the Durham, and my opinion is that the Durham will prove to be the best animal for dairy purposes also. You will be able to combine the two—to breed good beef calves at the same time that you get a good flow of milk. I think it will be conceded that the Ayrshire is the best milker we have; but as a combined animal, I think the Durham is decidedly the best. We supply more of the cattle we raise at Bow Park to breeders in the United States than to those in Canada. During the last two years the patronage Bow Park has received from Canadian farmers has been very small, because they do not give the prices that we get in the Western States. We look for our market to wherever we can get the most money. We have been raising our cattle principally for beef purposes. I believe the Durham is the best animal from the dairyman's point of view, because if it is found an unprofitable animal for dairy purposes—a poor milker—it can be utilized for beef. The bulls of the Bow Park herd which we sold recently at Chicago were from four months to eighteen months old, averaging twelve months, and the females ran from about eighteen months to about eight years old. We obtained an average price of \$310 for bulls and cows together. I believe a Canadian farmer, if he had a considerable number of cows, would find it exceedingly profitable to buy a high class bull at that price.

BOOTH AND BATES FAMILIES.

I believe the Bates family of Durhams are the best just now. Nine-tenths of the cattle in the market are Bates cattle, and the whole tendency on this continent is towards them. I may say we own a considerable number of Booth cattle also at Bow Park. In some families in-breeding has had a tendency to weaken the constitution of the animal, but in others, and when it has been judiciously conducted, it has not. In the Duchess it has not weakened their constitution, but it has impaired their prolificness. Still, everybody who wants a bull will go for a Duke. The experience of all Shorthorn breeders is that while the Duchess females are not perhaps the most prolific, the bulls have the most impressive power, and are the very hardiest animals which we breed in the Shorthorn interest.

FREEDOM FROM DISEASE.

I do not think a farmer, in investing in one of these animals, incurs a greater risk of losing it than he does of losing a grade or common animal on account of the tendency of the Durhams to pulmonary diseases; because, although you have sometimes pulmonary disease in the females, it is seldom perpetuated. The tendency to the disease is local and temporary, and only to a degree constitutional. I do not think this disease is owing to any delicacy of frame. I have never found it perpetuated in the commoner classes of cattle which the Durhams are crossed with. I believe the disease has been propagated in a great measure by injudicious in-breeding—I would not say by carrying in-breeding to too great an extent, because I know a great many animals which have been very much in-bred, and which are perfectly sound. If you are careful in selecting and using your bull, I think you can effectually keep off the disease.

[*Mr. Clay.*]

CROPS AND SOIL AT BOW PARK.

At Bow Park we raised from thirty-five to forty tons of corn in the green state. In the dry state it would amount to about 25 per cent. of that. I never tried clover and oats together. By sowing oats and rape we get very good grazing for a couple of months in the autumn. We can sow rye, and then plant a good deal of it down with corn. The soil of Bow Park is somewhat peculiar. There is no doubt that a large portion of the Grand River flats have been under water once upon a time, and you will find three distinct classes of soil there. On the bluffs, near the river, you will find sand and gravel mixed. There is a gentle slope down to the river, and farther down you will find mixed clay and sand; and down on the flats you will find a deep alluvial deposit. A great portion is clay, but it rests on a sandy subsoil, and the whole of that formation has been the result of an alluvial deposit, so that agricultural experiments would be tried there under particularly favourable circumstances. Besides, we have so many cattle there that the manure taken out every year is enormous. What we can do there would therefore not be a fair test to apply to the ordinary farmer. I am sorry to say that I do not find much tendency among the farmers of the country to purchase thoroughbred stock.

PERSONAL EXPERIENCE.

I followed farming in Scotland all my life before I came to this country. My father is one of the largest farmers in the southern part of Scotland, farming about ten thousand acres—about three thousand cultivated, and about seven thousand grazing. I have had more experience, perhaps, than most other young men on a grazing farm. For three years I acted as Practical Examiner in Agriculture, at the Royal Agricultural College, Cirencester, England. By observation I have acquired a knowledge of agriculture all over Great Britain and Ireland. I am still a Co-commissioner with Messrs. Pell and Read, and it is my intention to start for California and the Pacific slope in a month's time for the British Government. I think I have gone over nearly every agricultural State in the Union on the eastern side of the Rocky Mountains, as well as all over Ontario.

ADVANTAGES OF ONTARIO FOR STOCK FARMING.

I think there should be no more desirable place than Ontario, both with respect to climate and to the crops raised here, for raising cattle. This is undoubtedly a cheaper country for raising cattle than England. In the first place you have very much cheaper land. Then the generosity of the climate here is so great that you should grow much larger crops here than in England, especially if you manure. The common supposition is that you cannot produce so much in this country as in England, and all statistics go to show that to be the case. The produce of wheat, for instance, is 50 per cent. more to the acre in England than here; but I say that with as liberal manuring as they practise in Great Britain you could raise as large and a larger crop here. Farm buildings are also very much cheaper here. Perhaps in oats you beat the English farmers, but the oats are an inferior quality and do not weigh so much to the bushel. In barley you do not nearly come up to the English farmer; in peas you are perhaps as good as he; but in turnips you would have to yield him the palm also. Upon a farm in the district where I lived in Scotland they will put on about fifteen tons of farm-yard manure to the acre, and they will think nothing of spending \$10 to the acre in artificial manure afterwards. I do not think you often find that done in this country. If the Canadian farmer cared for his farm in a similar way I believe he would get better results than the British farmer.

BETTER DRAINAGE NEEDED.

One of the great sources of loss in this country is the want of drainage. Whole districts, on that account, are spoiled, and I think it is well for the Government to encourage

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the farmers to drain their land by lending them money at a low rate of interest. In Great Britain a farmer can borrow money from the Government at six and a half per cent, payable in twenty years, for that purpose. There are a great many swamps in Ontario which might easily be drained, and the land would not only be reclaimed, but the country around would be greatly benefitted. In England the money is lent directly to the farmer by the Government, and the landlord becomes responsible for the payment of the interest. The loan becomes a direct charge upon the rent, but as a rule the farmer always pays it.

BAD FEEDING AND HOUSING.

I believe my remark about the farmers badly housing and feeding their cattle in the winter applies generally to farmers in Canada. Their buildings are as a rule, drafty and cold, and the amount of food they give to their cattle is not enough to keep up their frames. This practice is very general throughout Canada, although you will find some of our farmers who keep their cattle in very good condition. I believe the percentage of farmers in Canada who neglect the proper feeding and housing of their cattle is fully sixty per cent. There has no doubt been an improvement made in that respect, but in the county of Brant, where I live, you will find the cattle kept in a most disgraceful condition. There is no doubt that in an economical sense the farmer loses by this practice. When he lets his cattle get down so low it takes them all summer to recover, and hence there is a great waste; the system is practically as wasteful as it is cruel.

FARM LABOUR.

I am decidedly of opinion that the Canadian farm labourer does as much work as the British. Female labour is unknown here. The Canadian farmer does not use as many hands as the British farmer, because the appliances in this country are so very much superior to what we have in Great Britain that a man does not need to use so much labour. The climate also is such here that you can make your calculations with much more certainty than in England. I cannot account for the fact that Canadian labourers, even with the extreme heat of this country, do more work than British labourers. A great many of the labourers who come to this country now are Scotch and English. Far the most valuable labour on the farms in Great Britain is female labour, which is unknown here; and, as both males and females work on British farms, the aggregate of labour would be greater there than here. In some kinds of labour, such as weeding turnips, hoeing, etc., women are much superior to men, and do much more work.

SOILING SYSTEM AND SMALL FARMS.

To Mr. Dryden.—I do not think the soiling system would be so profitable to a farmer with a small farm of from a hundred to a hundred and fifty acres as to one who had a much larger farm and could go into the system systematically. It resolves itself largely into a question of labour. You will find it very difficult on a small farm to arrange to keep a large supply of the necessary labour regularly. In the case of a man whose family assisted him on the farm, it would be different; but in estimating the matter in dollars and cents, you would have to estimate the labour of his family too.

SHEEP RAISING.

I am decidedly of opinion that our farmers will find it more profitable to breed small sheep than large ones. Of course you have to consider the cost of carriage, because sheep are carried not by weight but by the animal, and you will find that for a heavy sheep you will just get so much less per pound. A sheep dressing 80 pounds, that is 140 pounds live weight, will bring about eight cents a pound, while a small sheep will bring four or five cents per pound more. I am perfectly certain that the whole meat trade is resolving itself into a question of quality and not quantity, and the sooner the farmers can get

[*Mr. Clay.*]

that superlative quality which is required in the English market the better. There is no doubt that where you use one of the Duke bulls, the produce does not sell at a rate proportionate to what you pay for the bull. But here is the question. Suppose you take the higher grades of Bates cattle and use a commoner grade of bull on them, it is well known that it will spoil the line. I do not say that it spoils the animal, but it detracts from her impressive power for breeding again. I think it has been clearly demonstrated to the people of Canada that the high-bred cattle are the best cattle for this country.

SOME DURHAMS GOOD MILKERS.

To Mr. Balantyne.—There are some families of Durhams that are very good milkers and would be very suitable for dairy purposes. I think you will find that an impressive animal will carry out his prepotency both with animals of his own types and characteristics and with those of other types and characteristics; but this will be done more markedly by uniting an animal with a type of his own kind—a Shorthorn with a Shorthorn and a Hereford with a Hereford.

JOHN CLAY, JR.

MR. HOBSON'S EVIDENCE.

JOHN I. HOBSON, of Mosborough, was called and examined.

STOCK FARMING IN WELLINGTON.

To Mr. Dryden.—I follow a system of mixed husbandry—stock raising and general farming. The stock of cattle in my district has been considerably improved by the use of thoroughbred male animals. There has been nothing else used, I suppose, for twenty years at least, or if there has it has been the rare exception. All the farmers in the south riding of Wellington use thoroughbred animals at the present time. The breeds used are Durhams, Herefords, Galloways, and Devons—chiefly Durhams, which I think are the most profitable to cross with the common stock of the country. I have seen half-bred Galloways and half-bred Herefords, and have found them to do very well in all cases; still, I prefer the Durhams. I have had no experience in dairying. Speaking from my own experience I have not found the Shorthorns to be very good milkers, but I know of others who have had good lines of milking Durhams.

BREEDING FOR BEEF.

I have bred chiefly for beef. I believe as a general rule that cattle with a great aptitude to lay on flesh are not good milkers. I occasionally get common cattle and have seen a good many fed; but of course there is a very great difference in favour of a well-bred, well-made animal, because good breeding means not only a well-made animal but an animal of superior quality and with an aptitude to fatten. In raising cattle for the foreign market, I have found in my own experience that there is more profit in getting them ready to ship to England at from 26 to 28 months old than at any other time. I think it pays better to get them off then than to keep them for a year longer. You can get a well-bred, well-fed animal at that age, up to 1,300 pounds or a little higher, and buyers are ready to take such cattle at good prices. When I say good prices, I mean about \$5.25 per hundred—that would be for what we call winter calves—calves bred in February and sold in May two years afterwards. I have seen very good cattle for export from the first cross, if first-class bulls are used, and when you come to two or three crosses they make very good feeders indeed. The time at which calves should be dropped depends very much on the object you have in view in breeding. If you are breeding for the purpose of raising cattle for the butcher or for your own use, I should say that March or April was a good time; but if you wish to breed thoroughbreds to sell as breeders, I think it is better to breed earlier.

[*Mr. Hobson.*]

TREATMENT OF CALVES.

You should have your young cattle well developed, especially young bulls, and if you do not have your calves to come earlier you have to hold them over for the second season, and there is more profit to sell at twelve months than older. I let my cows suckle the calves, as a general rule, from five to seven months. It depends a little on special circumstances. I do not care to let the first calf a heifer has suck too long, as it is rather hard on the mother; but if it is a heifer with a tendency to lay on flesh I would let it suck a little longer—say five or six months. Sometimes I feed with the pail and then I use milk pretty liberally; I also give them all the meal and bran they can eat. I usually feed my calves peas and bran, or peas, oats and bran. I used to feed corn, but the duty on that article hurts us a little; last fall we could get peas for 55 cents a bushel, and I found them cheaper than corn. During the first winter I would let the calves run loose. I think that is better than having them tied, as they should have exercise. During the first winter I feed them on hay, meal, roots—turnips and mangolds, but principally turnips—and bran, which I have used very largely of late years, and, I think, with great advantage. If I saw cattle were losing flesh under the system I was following, I would vary their feed a little—give them more meal, perhaps. But I would seek always to have them kept fat.

SYSTEM OF FEEDING—CATTLE FOODS—ABORTION.

I always feed more or less meal, and, I think, with advantage,—I believe it improves the style. I have not adopted the soiling system to any extent except for bulls and a few odd animals. Turnips are the principal root I use. To all the cattle that can break them I feed them whole, but if they cannot do so I cut them. I have used advertised cattle feed once or twice, under the persuasion of the manufacturers, but I never used them to such an extent as to qualify me to speak intelligently with regard to them. I do not think heifers should begin having calves until they are from thirty months to three years old. If I saw heifers inclined to become very fat I might breed earlier, because when there is a tendency to become very fat there is sometimes difficulty to get them in calf—at least that has been my experience. I think breeding cows should be kept in what liberal feeders would call good condition; I do not think they should ever be allowed to get down. I have not had very much trouble with abortion. I have had three cases this spring, which may have been owing to my system of feeding. I changed my system of feeding breeding cows somewhat last winter. I had an unusual crop of turnips—a sort of second growth that were not so solid as they usually have been—and instead of feeding hay I fed turnips very liberally—turnips and oat straw—and we had some cases of abortion. I then changed that food for hay and a small quantity of roots. I do not know whether there is any permanent cause of abortion, but I noticed that Mr. Cochrane has said that he objected to feeding too many roots, because they would cause abortion, and I thought that from my own experience that might have been the cause of it. I have heard complaints about getting cows to breed. I never have had much difficulty myself, and I think those who keep their own bulls find very little difficulty. I think the travelling and overheating may have something to do with the difficulty in getting some cows in calf.

ADVANTAGE OF THOROUGHbred STOCK.

To Mr. Byrne.—My thoroughbred herd consists of about 35 or 40 head—all Durhams. I have not much grade stock. The advantages of thoroughbred stock over grade stock are earlier development, a greater aptitude to fatten, a much higher quality, which of course brings a greatly increased price on the market, and a much more pleasing animal to the eye, which is a little to be considered. The same food and the same attention is required for a common animal as for one of pure blood. I usually feed my calves in the winter on mixed food, such as pea and oat-meal and bran. I commence with half bran, and afterwards reduce it to about one-third bran to two-thirds meal. I prefer

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keeping my cattle in comfortable, warm stables to open sheds. I consider a bushel of roots a day to be good full feeding for breeding cattle. I have never tried pumpkins, and don't know their advantages.

GOOD STEERS IN DEMAND.

To Mr. Malcolm.—I do not think there are many of our farmers who raise enough steers to keep their farms up to the proper mark of fertility. It would perhaps pay better to buy steers and feed them for the market than to raise them, but there is sometimes a great difficulty in getting hold of the right class of cattle. If we could get good steers whenever we liked, I think it would pay better to devote our attention to feeding. If I bought a steer weighing 1,100 lbs. for \$35, I would like to double his value before sending him to market. I think some steers that have cost \$35 have realized \$70. It would require about five months to realize this result. There are fairs in January and the early part of February, just after the Christmas fairs with us, and then the markets are commonly glutted with half-fed cattle; and I think they could be bought and fed for the English market with very great advantage.

WEANING CALVES—BRAN.

In weaning calves I don't think you need make much change in their food, because while they are on the milk they are gradually getting accustomed to take the ordinary feed we use during the winter—bran, hay, roots and grass—and about the time they are taken from the milk they are pretty well used to taking what is given to them. I think oats and peas and bran are very good food for young cattle. I have fed considerable cornmeal. I don't know that it is worse or better than peas, but I have not found them to take so kindly to it. But if you can get them to take to it as kindly I think they will thrive on it as well. I think bran fed to cows induces a flow of milk, though I cannot say whether it improves the quality or not. I do not consider that farmers use nearly enough bran as a general rule, because I think it is a much more valuable cattle feed than is generally supposed. I see no reason why soiling should not be profitably practised by ordinary farmers. I cannot give any particular reason why the farmers do not adopt the system, except that farmers, generally speaking, are rather a conservative sort of people, and generally continue to do what they have been accustomed to. For myself I think it would pay, but I have not gone into it; it would be such a complete change. I think we shall have to come to it however, in order to preserve the fertility of the soil. I feed my cattle all the salt they want. I do not feed oil cake.

ROOT CROPPING.

To Mr. Ballantyne.—I plant from twelve to twenty acres with roots on a farm of three hundred acres. The average yield per acre, I think, would be about 550 bushels. I would just like to say that I cannot account for the extraordinary crops of turnips that we constantly hear of being raised all over the country. I have been over a good part of Ontario, and I think we grow as good turnips in the county of Wellington as are grown in any other part of Ontario, and I have never struck one of these extraordinary growths. I never saw thirty tons of turnips to the acre in my life. I raise a few mangolds, which I think are exceptionally good for the latter part of the spring. They come in well after the turnips. They keep better than the turnips, and are fresher. Although they are not so good for fattening purposes, they are very good for stock that are giving milk.

LIBERAL FEEDING—FIRST CROSSES.

To Mr. Wisser.—I am decidedly of opinion that the most profitable way to feed cattle is to keep them in good flesh from the time they are calved until they are twenty-six or twenty-eight months old. I think it would pay better to sell them then than to keep them

[*Mr. Hobson.*]

until they are three years old. I think peas are quite as good as corn for feeding purposes; of the two I would prefer peas. I seldom feed meal to steers when they are on grass except when I want to get them in good condition for the Christmas sales, and then I give them something exceptional. When they are on grass I would not give them any other feed, and sometimes they won't take meal at all. But as a general rule there is no difficulty in getting them to eat meal when on pasture. One cross with a thoroughbred is a great improvement for shipping as well as for our own market. First-class cattle for shipment are worth five and a quarter cents a pound, while a native steer, if you could get one, would not be worth more than four cents a pound. Besides there would be a difference at three years old of at least 300 lbs. in weight. I think it would be an advantage to our farmers in every way if they would pay more attention to the breeding of their cattle. One of our ordinary bulls running in the pasture is worth at a year old, I suppose, about three cents a pound; you could not put any value upon him at all as a stock getter. I wouldn't put a value on the brute at all—I don't think he is worth anything except for beef, and not much for that.

To Mr. Wilson.—You would get a very good animal from one cross with the native stock. A first-class bull will leave his impress much more on the first cross than he will on the third or fourth. If I were feeding for milk purposes I would not exclusively use turnips, which taint both the milk and the butter, but I would feed a little bran and meal along with the turnips. Mangolds might possibly affect the milk if they were fed in large quantities, or if you fed them with straw, but not to the same extent as turnips.

WINTER FEEDING.

To Mr. Gibson.—I do not give the cattle water before feeding them roots. The roots are the first thing they get in the morning, and then we give them some dry feed, and then they are turned out for water during the day. The length of time they remain out depends somewhat on the state of the weather.

To Mr. Byrne.—I feed the cattle with food in the raw state. If we are likely to be short, I use the cutting box for hay, but when it has been selling at six or seven or eight dollars a ton, I don't think there is much advantage in using the cutting box. But by cutting the hay and mixing in a little straw you can make the same quantity go a great deal further. I do not feed much straw, however. I feed hay nearly altogether.

To Mr. Malcolm.—My idea of native cattle is cattle that have been raised in neighbourhoods where the farmers have never been in the habit of using pure males of any sort, or even good grade bulls. Common Canadian cows, however, are often good milkers.

To Mr. Stock.—I never found it injurious to the mouths of the cattle to feed them turnips whole. Of course they have always to be cut for the yearlings; but where I find the cattle can break them readily I do not think it best to cut. If you cut them into pieces or slices there is quite as much danger of their choking.

VARIOUS BREEDS—THE HERD BOOK.

To Mr. Dymond.—Besides the Durhams, I have had some experience with half-bred Galloways. I have not gone into the raising of Polled Anguses. I feel a little diffidence in expressing an opinion about the Canadian Herd Book, because I am not very well posted with regard to pedigree stock. Though I deal entirely in thoroughbreds, I look as much to quality as to pedigree. I have not bought any thoroughbred cattle except what were registered in the Canadian Herd Book. That always suited me, and I have not traced them through any other book. If I bought a thoroughbred animal I would want to know its breeding, and would consult that book, and I always found the pedigree of the animal I was buying. But I would judge an animal on individual merits as well as on its pedigree.

[*Mr. Hobson.*]



SHORT HORN COW.

GOOD BUILDINGS NEEDED.

I think there should be good buildings for the housing of cattle. In the winter time the stables should be kept to a certain temperature, because if the stables are too cold it is well known the cattle would require more feed and would not do so well. If cattle are kept warm and comfortable they thrive better on a given quantity of food, and will sell at a much better price in the spring. The cost of converting a farm of 100 or 200 acres from the grazing system into the soiling system would not be very great. Of course there would have to be extra labour employed; a man, or a man and a boy, would be required to look after and feed the cattle. You would also have to have more buildings, though the outlay in that respect would not be large, because some of the buildings used for the stock in the winter time could be used for the soiling system in the summer time. I have sometimes thought that in the soiling system it might possibly be better to use sheds than stables in the summer time.

IMPROVED STOCK PROFITABLE.

I believe it would pay a farmer having only twenty or twenty-five cows to buy a bull at a cost of about \$300. Bulls vary a good deal in the length of time they are serviceable. They usually begin to be unserviceable when they are four or five years old; but my experience is not such as to warrant me in speaking with as much authority on that subject as some others might. A thoroughbred animal three years old and weighing 1,500 pounds, would bring, at five and quarter cents a pound, \$78.75, while a common animal at the same age, and weighing 300 pounds less, would bring only \$48, being a difference of \$30.75. Besides, in one case you are selling a well-bred animal, and in the other case a common scrub. My experience has always led me to believe that a well-bred animal is quite as easily and as cheaply fed as a common animal; that is to say, having the two animals, you would get 1,500 pounds of good beef at the same cost as you could get 1,200 pounds of poor beef.

To the Chairman.—Though I have been handling horses all my life I do not consider myself an authority. I raised a good many for the market at one time, but I did not succeed with them, and I came to the conclusion that I did not conduct the business intelligently.

SHEEP RAISING.

I have fed a good many sheep, and have been in the habit of buying pretty largely. I usually buy in September and the early part of October, and feed for the Christmas market. If the market does not suit very well I hold them over for a short time. I do not like ram lambs,—I usually buy ewes and wethers. I generally just have to take the average lambs that are going.

LAMBS FOR FALL FEEDING ON RAPE.

To Mr. Ballantyne.—I generally take 200 lambs and upwards for fall feeding. I feed them largely on rape, and also on oats and turnips when the weather gets bad. They paid very well last year; the increase in price at which I sold them was about \$2 a head. The average weight at which I have sold them has been a little over a hundred pounds. The last lot I sold on the 12th December averaged 107 pounds. The land on which the rape is raised I summer fallow, but do not manure. The manure of these sheep is valuable and an important consideration in feeding them.

To Mr. Gibson.—I usually sow the rape during the first damp weather after the haying begins, about the first week in July. I sow it with a drill and ridge it, though I think it is fully better to sow it on a flat. I keep sowing it thinner and thinner every year. I would not put more than three-quarters of a pound to the acre; the smaller quantity you sow the better. I usually have in view a partial cleaning of the land at the same time.

To Mr. McMillan.—I vary in the number of acres which I sow with rape. I usually
[*Mr. Hobson.*]

sow from ten to twenty acres, sometimes as many as thirty acres. I generally have a very heavy crop of rape. I very commonly use plaster on the land, and I believe, taking one season with another, that 150 pounds of plaster will double the crop of rape.

THE TRADE IN LAMBS AND SHEEP.

To Mr. Dymond.—The price which I pay for lambs varies very much, but they usually run up to about \$2.50. The year before last I had to sell them at \$3.62 $\frac{1}{2}$, and there was not very much profit in them, but I never pass by good sheep if they come in the way when I am buying lambs; and in the same season I sold a lot of over 150 sheep, all of which went to the English market, and while I had not got a large increase on the price of the lambs the sheep were sold for something over \$6, and I made very well on them. The business of feeding sheep is a very profitable one.

FARM ACCOUNTS AND PROFITS.

I keep what I would call pretty correct accounts. I think most of the farmers in my neighbourhood keep cash accounts, but no accounts that give the profits and losses of the farm. I do not see why farmers could not keep a pretty close account of all their transactions. I do not think it would be possible for them to have so correct a system of book-keeping as to enable them to calculate the cost or the profit and loss of any particular crop, but still I think a system of accounts might be kept which, to say the least, would be very satisfactory to the farmer himself. I consider that farming—thorough farming—will pay a good fair interest, if the farmer knows his business and attends to it. I believe, taking a course of years into consideration, that a well-conducted farm will pay seven per cent., and very often more,—that is, charging the expenses and services of the family as part of the calculation. Good farms in my district are worth from \$60 to \$65 an acre.

WHEAT CROPPING.

To Mr. Dryden.—The wheat which has been principally grown in my section of country has been, up to the last two or three years, spring wheat. There has been a good deal of fall wheat grown during the last two or three years, principally Clawson and Treadwell.

BLIGHT—HESSIAN FLY—RUST—MIDGE.

The reason the farmers have sown less of spring wheat is that it has failed a good deal. I think the cause has been partly climatic. The failure has been so noticeable on the best tilled lands that it could not have arisen from the land being worn out or from imperfect tillage. We could not find out any particular cause except something like a blight—not a rust. Fife was the variety of spring wheat chiefly grown. It formerly grew very well in our neighbourhood. On the best tilled lands I think the average has not been much below eighteen bushels to the acre, and it has often been a little more; but when you take the general average of all the farms, it has been exceedingly low. We are, of course, troubled with other causes of failure besides the blight, such as the Hessian fly, and rust and midge. The general average of wheat is much lower than it was some years ago.

THE PEA BUG—CANADA THISTLES.

We have not grown many peas lately, on account of the pea bug. There is a bug to each pea. The only remedy I know of for this pest is to stop growing peas altogether for two or three years. I was told by Mr. Renton that it was very bad in Wentworth about twenty years ago, and that the farmers generally gave up growing it for two years, and the result was that the bug was destroyed. I don't think there is any other remedy. The principal weed we have to contend against is the Canada thistle. We are not much troubled with anything else.

[*Mr. Hobson.*]

THISTLES.

The only remedy I know for the thistles is summer fallowing. They have to be looked after in July and August; but I found that, with all the working I could give to my land, spring and fall, they were gradually and slowly on the increase, so I adopted summer fallowing, and many of my neighbours have come to the conclusion that there is nothing like that for ridding themselves of the thistles. I think it is well to let the thistles get well up before ploughing them in, and you should select a time when the weather is fine and dry; but I would not let them get so high as to make it difficult to plough them in. If they got very high I think I would cut them before using the plough.

DRAINING—GRAIN CROPS.

There has not been much attention paid to drainage in my neighbourhood. My land is rolling. There are some parts that would do better for being drained, and before the tile-drainage was generally used I put in common stone drains where they were required. They are beginning to get out of order, and I intend to replace them with tile. Besides wheat, we grow peas, oats and barley. We do not grow nearly so much barley as they do in some other parts of Ontario. I think our land is perhaps rather stiff for it. To grow barley successfully you require to sow it in a sandy loam. It is difficult to estimate the actual cost of raising an acre of wheat, because there are so many things to be taken into consideration. For instance, this year I am raising a crop of twenty acres, and in order to prepare the land I summer fallowed it until there was not a thistle to be seen; I ploughed it five times very thoroughly; and it would not be proper to charge all this labour to the single crop of wheat. And when you put on manure it is rather a nice question to say what proportion of that should be charged against the first crop, and what proportion should be carried over to the third or fourth year.

EFFECTS OF SALT ON WHEAT.

To Mr. McMillan.—The way the blight affected the wheat two years ago was that the straw commenced breaking down some eight or ten days before harvest. I have been in the habit of using salt very largely for manure. Some years ago I had fifteen acres in one field, and I selected eleven acres upon which I put salt, and left four acres without salt. The result was that the wheat sown on the four acres without salt fell down and was almost worthless, while the other stood up and was very fine.

To Mr. Ballantyne.—The soil upon which the salt was used was a clay loam, undulating land. I consider that that year the salt saved the wheat, as it seemed to be a complete antidote for the particular ill that affected it. I always use salt on my turnip crop. I think it is pretty well understood that there is a percentage of salt in turnips, and I have noticed that in dry seasons when salt is used they are not nearly so liable to wilt. It seems to add moisture to the soil. I generally use about four hundred pounds to the acre.

THE FOREST REMOVED.

To Mr. Byrne.—The original forest in my neighbourhood has been pretty much removed. I could not say what effect that has had on the crops. When the country was well wooded we used to have pretty good crops of fall wheat; but in the northern part of Wellington, when the country was wooded, they could not grow fall wheat, and since the woods have been cleared they have been very successful in growing fall wheat. So here are two opposite results. I think the land in the north and the south is pretty much the same.

OAT CROPS.

We grow a good many oats. On well-managed farms they will yield from fifty to sixty bushels to the acre. When the oat crop fails I think it is generally due to

[*Mr. Hobson.*]

bad tillage and impoverished lands. The variety most generally grown is the common white. We generally sow with a drill or with broadcast machines. We do not grow much rye in our section. We do not use rye or barley much as a green feed for our cattle.

To Mr. Malcolm.—There is hardly any fall wheat sown upon barley stubble. There is a good deal sown on pea stubble, and with manure it does very well.

CORN—ROTATION—SUMMER FALLOW.

To Mr. Byrne.—Our farmers do not cultivate much Indian corn, as they find that other crops pay better. Our land is a little stiff for it; it does better on free soils. We cannot grow corn in Ontario so well as they can in the Western States. Potatoes are not much grown. Among the best farmers rotation of crops is practised. The rotation I observe is, first peas and oats, then wheat or barley, then roots with manure, then wheat or barley, and then seed it down. It is generally left three years in grass; but there is a difficulty in keeping up a regular rotation in consequence of dry seasons and other contingencies. We generally use one manuring in the rotation—that is once in every six years. In growing fall wheat we use manure; but, speaking generally, it has mostly been used with the root crop. In addition to the rotation of crops I think it is necessary to give the land a rest, by means of summer fallowing, for the purpose of keeping it clean.

To Mr. Wilson.—I believe timothy does very well when sown in the fall; but I believe it is not usual to sow grass seed in the fall. The varieties of spring wheat we use are the White Russian, Lost Nation, and some Bald China. We have pretty much abandoned the Fyfe.

JOHN I. HOBSON.

MR. MILLER'S EVIDENCE.

JOHN MILLER, of Brougham, Ontario county, was called and examined.

STOCK FARMING IN ONTARIO COUNTY.

To Mr. Dryden.—I have been pretty largely engaged in the business of breeding cattle, sheep and horses since 1835. I have devoted myself to mixed farming. In the raising of cattle my object has been to breed bulls to sell to farmers for the purpose of improving their breeds. I have handled Shorthorns principally, and a few Galloways and Ayrshires.

THE SHORTHORN THE BEST FOR THE FARMER.

The best breed of cattle for the use of the ordinary farmers of this country, I think, is the Shorthorns. Some families of them are very good milkers. I have had very good milking Ayrshires, but I have known some of the best families of Durhams to give more milk than they would. I think it is best, in breeding cattle, to endeavour to combine the two qualities of milk and beef. I have known grade cattle to be very good milkers—crosses of Shorthorn bulls and Canadian cattle are just as good as the Ayrshires for milking purposes. I think it is very injudicious for our farmers, if they want to get cattle either for beef or milk, to use any other than thoroughbred males. If they want to act for their own interest, they will have a full bred animal, and a good one at that. I would look for a good animal before I would for a pedigree; though if a good animal has a good pedigree also, he is so much the better.

[*Mr. Miller.*]

BOOTH AND BATES FAMILIES.

I have seen the herds of Booth and Bates. I was at Captain Gunter's, Wetherby, in 1868, when Mr. Cochrane bought Duchess 97, and in 1870 when Duchesses 101 and 103 were bought, and I came across to this country with them. I believe the Bates and Booth cattle have been kept pretty well separate up to the present time. It is generally believed that these are the best families. I thought the Booth cattle were the best adapted for beef when I saw them first; but I mix my animals, and if I get a good bull, I do not pay much attention if he is crossed in the two families, because they are both thoroughbreds.

THE CANADIAN AND AMERICAN HERD BOOKS.

So far as I know, the Canadian Herd Book is authentic. It contains the pedigrees of the animals mentioned in it, and when a man buys them he can judge for himself as to their value. I would not breed from a short pedigree; but so far as I know, our Herd Book contains an honest record of the pedigrees. The remarks I heard here yesterday were the first I ever heard to the effect that it was valueless. I have the English, American, and Canadian Herd Books; also the Kentucky Record. Mr. Clay yesterday spoke of the Ohio Record; I never heard of it. A great many of the pedigrees in the American Herd Book have been disputed and found out to be wrong, but in some of the latter volumes I think they were all corrected.

MANAGEMENT OF CALVES.

I think it pays best to have the calves dropped towards the end of the year. I would sell the bulls when they are from twelve to fifteen months old. They are commonly bought in the spring for breeding purposes—about March or April. I have had very little experience with steers; I have not had them about the place for many years. This year I fed four heifers, and sold them for the English market. I usually keep my calves shut up in the house, and let them to the cows twice a day, morning and night. We usually keep them shut up for six or seven months, and give them grass when I can cut it, oats and peas, and a little bran. I allow the calves to run loose; I think this is better than tying them, as they need exercise. After they are weaned I allow them to continue to run loose until winter, and then I tie them up. I am speaking now of the heifer calves. The bull calves I allow to run loose in separate boxes.

SOILING—CATTLE FEED.

I have done a little at the soiling system—not very much. I use western corn largely for cattle feed. I have tried no other food for soiling. I feed that when the grass is bad in the summer time. I cut it green, and haul it to another field and feed it to the cattle there by spreading it on the grass. I have used the western corn in the winter time. If we have not turnips enough, I find it very good cut and steamed and mixed with chaff. I think the soiling system would answer a very good purpose even on a small farm. It would be a great deal better for a small farmer than to let his cattle run around the roads, as many do, as it would not only have the effect of keeping the manure on the land, but would benefit the cattle themselves. I have not had much experience with any of the advertised cattle feeds. I have had sent to me little packages to have it tried, but so far as I saw the cattle derived no benefit from it, and I was never induced to buy any. So far as I am concerned, I would not advise its use. In the winter season I rely principally on turnips and hay. To the young cattle I give a little peas and oats chopped up—about half and half. Turnips are the principal roots I grow. I have had a few mangolds and carrots, but I consider turnips the most profitable and the surest crop. For the sheep and young cattle I cut the turnips, but to the others I feed them whole. I have not used a pulper on my farm.

[Mr. Miller.]

BREEDING COWS.—ABORTION.

I have known my cows to breed both when in high and when in low condition. Some will breed, no matter what condition they are in, and others it is difficult to get to breed no matter how you keep them. I have had cows that have bred just as well when taking common fare in the fields with the other cattle as when kept in good condition. Some that were kept poor would not breed at all, and others that were kept in high condition would breed all the time. I don't see that it makes much difference, though I think it hurts their constitutions to keep them in high condition for a number of years, and then let them get in low condition. I could not say that the kind of food they get has anything to do with their being non-breeders. I have had some difficulty with abortion for two or three years. It seemed to be infectious for that length of time. It seemed to me to be rather a serious business when it remained for two or three years, but we have not been troubled with it since that time. I don't think it went because of any change in the treatment or feed of the cattle. Sometimes our best heifers won't breed. I cannot attribute that to any particular cause. I generally breed my heifers at two years-old. But I consider that we would have better cows and raise healthier, stronger animals if we left them until they were three years old—that is, if they would breed then. In the case of non-breeding females, we have tried a good many bulls and the result seems to be the same. Of course there are some males that are not sure. There seems to have been more trouble in this way during late years than there was before, but what the cause of it is I cannot tell.

FIRST CROSSES.

I have seen very good animals produced, and well fitted for export, from the first cross—both in cattle and sheep—better, very often, than the second cross, because they are liable to breed back to one side or the other, and they sometimes go to the bad side. I would not consider it desirable to couple two crosses together. I would use a half-bred female but not a half-bred sire; I would not cross with a half-bred sire of any kind.

COLOUR IN THE SHORTHORN.

To Mr. Stock.—I have tried a cross between an Ayrshire cow and a Shorthorn bull, and have obtained a middling good animal. We know that by continuous breeding of the Shorthorns their colour has changed like the fashions. White was the first fashionable colour, and then roan. The shorthorns when I knew them first were a different shaped animal from the animal we have now—they were larger and coarser. Red seems now to be the fashionable colour. I think the whites and roans are better milkers than the deep red, better feeders, and better animals altogether.

IMPROVING THEIR STOCK.

To Mr. Malcolm.—There was more improvement in the stock of the ordinary farmers of our section of the country ten or fifteen years ago than there is now; I do not know for what reason. During the last year or two they are taking more interest in the improvement of their stock. When they went back their cattle did not seem to be selling so well, and I am sorry to say it was too much the case that our young men, during the last twelve or fourteen years, did not find it so fashionable to go into the raising of stock as to go into some profession. The young men now seem to want more education than they got a few years ago; and when they get education they don't want to dirty their hands with work, but try some easier way of making their living. I would not consider education a disadvantage to a young farmer if the young men had more common sense and would go back to the farm. I do not know what remedy to suggest for this dislike of the farm. I think it would be an advantage for ordinary farmers, with farms of a

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hundred or a hundred and fifty acres, to go generally into the breeding of high class animals—even the breeding and selling of bulls for the improvement of the common stock of the country. The farmers would have to buy from each other to keep their own stock improved, and there would be more good cattle in the country for export to other countries. The reason our farmers do not adopt the soiling system more generally is, I believe, because it requires more work. Work seems to be a great bugbear in this country, and people seem to prefer to do things in the easiest way they can.

HIGH AND LOW CONDITION.

I do not make any distinction between the expressions “high condition” and “breeding condition.” “High condition” I would call in show condition. Some animals will breed in whatever condition they may be. I have heard it said that some animals are injured by being in show condition, but I have never found it to be the case in my experience. I have never heard of any breeder becoming ruined by getting his animals in so high a condition that they will not breed, but I have known men to be ruined to some extent by getting highbred animals and not knowing how to take care of them. I have fed a good deal of bran to my stock. I think for young animals bran is very good for keeping them growing; but if you have plenty of roots you can do with less bran. Milk food, I think, is very good if it is mixed with other food, and the animals seem to like it better than anything else.

SHORTHORNS AS MILKERS.

To Mr. Gibson.—For milking purposes I would choose a Shorthorn bull to cross with the common Canadian cows. I have not had experience with an Ayrshire bull, but I believe a Shorthorn bull belonging to a good milking family would produce more milk than an Ayrshire. A pure Shorthorn I would call an animal with a good many crosses, and from imported stock on both sides. I would not call an animal with four crosses a Shorthorn, and would not approve of it being entered in a herd-book. Even if it was entered in the herd-book, I do not think it would make the herd-book any the less valuable, because a man can always see whether an animal has a short pedigree or not. Even if a farmer had only ten cows I believe it would pay him to buy a good bull.

To Mr. Malcolm.—The heifers which I could not get to breed were not those that were kept in high condition for show purposes. I think all the cows I took to the shows were breeders; I don't know of a bad one among them. I consider the Canadian Herd Book just as reliable as the American.

FANCY PRICES.

To Mr. Whitelaw.—I think it is a mere fancy that makes some buyers give higher prices for some Dukes for breeding purposes than they will for others; many of them are no better than others which sell at lower prices. I have seen a good many Duchesses sold at high prices at New York Mills sale, to go to England and Kentucky, which are not alive now. One of the best investments a farmer can make is to buy a good bull for \$200 or \$300. I have come to the conclusion that unless the farmers of Canada set to work to drain their lands and improve their stock, they may as well pull up their sticks at once.

IMPORTATION OF STOCK.

To Mr. Dymond.—I have been engaged in farming since I came to this country in 1835. My father and uncle were farmers all their lifetime. In 1835 I brought imported sheep and pigs to Markham for my uncle, Geo. Miller, and shortly after that I commenced the introduction of improved cattle. I had to look after a Durham bull which had been bought by my uncle in 1834 from Mr. Wingfield, and he bought another in 1846 from Mr. Howitt, Guelph, which stock he bought from Mr. Wingfield. They were the only Durham bulls in that part of the country at that time. In that district

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of country it is very common now for persons to own a well-bred bull. Owing to the introduction of these bulls there has been a material improvement in the native stock.

SERVICES IN A SEASON.—SHORTHORNS AND AYRSHIRE COWS.

A good bull can serve one hundred cows in a year. I had a yearling bull that served eighty-nine cows in one season and took all the prizes in the same year. If the animal is kept in a healthy condition, it does not injure him to use him to that extent. I consider it profitable to cross Shorthorn bulls with Ayrshire cows for dairy purposes, but not more so than with the native stock.

PEDIGREES.

I have no herd-book for Ayrshires; the Canadian Herd Book does not include anything but Shorthorns. This Herd Book is compiled under the authority of the Agricultural Society. When I raise a calf, I send its pedigree to be entered in the Herd Book. The means they use to ascertain whether any statement is correct is to refer to other Herd Books, and if the pedigree is not correct they will reject it. Besides, a man's reputation is at stake, and if he sends anything that is wrong knowingly, he will never be recognized as a reliable breeder again. I don't think the Agricultural Society take any special means to verify the statements that are sent to them; I believe they depend upon the integrity of the breeders. The Bates and Booth cattle have, I believe, been intermingled to a certain extent. I think crosses of the two families are better than the products of in-breeding.

BEEFING AND MILKING FAMILIES.—CORN.—SOILING.

I would say that the Booths are better than the Bates for beef. There are various divisions of these families, which vary considerably in their milk and beef producing quality. I have no western corn growing this year, as I have no land suitable for it. At one time we imported a great quantity of corn into our part of the country for feeding purposes. We do not import much now. We use peas instead. I think they are as cheap, and they are as good as, or better than corn. A good many of my neighbours have been troubled with the bugs infesting their peas lately. None of the farmers with a hundred or a hundred and fifty acres of land in my district have adopted the soiling system that I know of. We have not yet discussed the subject, though I have seen a good deal of it in the agricultural papers. The local Agricultural Society have not yet taken the matter up. The advantages of the system to the ordinary farmers must be learned from the agricultural papers, but I don't think many farmers read them, and they might remain in darkness so far as any steps to enlighten them are concerned. From a farmer's point of view, I don't think the present school system is at all a good system. There are more branches taught in the schools than are taught thoroughly.

THE EXPORT TRADE.

I do not know whether the decline of interest in the improvement of stock has been owing to the termination of the Reciprocity Treaty in 1866. Up to within a few years ago our farmers found their market for the sale of their cattle chiefly in the United States. The beginning of the cattle trade with England, two or three years ago, has been, I think, the cause of stimulating a revival of the cattle trade, and I think there is at the present time a greater spirit of enterprise among the farmers than there has been for the past two years. For the production of beef for export I strongly recommend the use of the Durhams. They are a heavier animal and produce better beef than any other. I have seen a good many of the Polled Angus breed in Scotland, but I could not say much about them. I thought

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POLLED ANGUS BULL.

they were a good deal like the Galloways, only a more stylish animal, heavier and better for beef. I have had no experience as to how they would suit the English market, as compared with the Durham. The English papers seem to indicate that in the fat cattle markets, such as Smithfield, they would compete very favourably with the Shorthorns.

ABORTION.

When I spoke of abortion being infectious, I used the term in its popular sense of catching. The best English authorities on the subject, which I have read, use the term infectious as applied to abortion. Some of my cattle which had been troubled with abortion became good breeders in two or three years. I made no change in my mode of treatment, and I don't think anything of that kind had anything to do with improving them. I do not keep them apart but let them run together, and since that time I have not had any trouble more than once or twice.

FARMERS' SONS.

All my sons have remained on the farm except one. It is very much the practice of our farmers' sons to leave the farm. They seem to think that they can make a living easier than by working on the farm. I don't think they are lazy, but they don't like farm work. I could not say whether that is owing to our system of farming in this country being very unattractive. If we could make it more attractive, I would like to know the way. In the old country the farmers' sons seem to like the farm very much. If improvements in agriculture and the management of stock were introduced among the farmers, and if they could get up some kinds of amusement on the farm, I think perhaps the young men would stick to it.

CONDITION OF MALE ANIMALS.

To Mr. Dryden.—Male breeding animals I would keep in moderate condition and give them plenty of exercise. For show purposes the higher condition is better, but for breeding purposes I think the moderate condition is the best. I have known male animals to be injured permanently by being kept in high condition for show purposes. I think the Durham cattle of to-day are considerably better than they were at one time. They are finer in bone and are more even and better in flesh. The Shorthorn animals, when I saw them first, appeared to be larger and grosser animals than I would like to have them now. As to colour, they are bred now mostly red, because they sell better, and red is the fashionable colour. But that is not my taste; I prefer white or roans. I suppose it would be possible to cross the animals in until you could get an animal of a uniform colour. At first the Galloways were not all black or all mooleys, but they continued to be inbred until they became as they are now. I think the fashionable colour of the Shorthorns is a mere matter of taste.

WINTER FEEDING,

To Mr. Byrne.—I think the most economical way in which a small farmer can raise his own cattle is to grow the stuff he feeds them on himself. If a farmer feeds his cattle all winter on straw, they won't come out in very good condition in the spring. My cattle don't get much straw; I feed them principally on hay; but if straw were mixed with chop or bran or something of that kind, they would do very well on it. I think they would do better on it if it was softened than if it was dry.

SCHOOLS.

It costs more now to send a boy to school than it did thirty or thirty-five years ago, and I don't know that there is more benefit to be derived now than there was then, although the schools are better. The teachers of to-day are a higher class of teachers than they were then. I have formed no opinion as to the benefit of teaching elementary farming in the schools.

[*Mr. Miller.*]

To Mr. Malcolm.—If a farmer's son had a special taste for professional life, and would do better and enjoy life more in it than by working at manual labour on the farm, I would advise him to go into it, because if you try to make a person do something against his will he will never succeed in it.

FARM BUILDINGS.—TURNIPS.—WHEAT.

To Mr. Dryden.—There have not been many new farm buildings put up in my district lately. The farmers usually keep their cattle housed up. I think that is a great advantage, as the natural heat of the cattle is kept up by putting them in a stable, and they require less food to be kept in good condition. It would not do so well to feed turnips to cattle kept outside in the cold as to those in the stable, as turnips are a cold food. Spring wheat in my vicinity has been a failure during the past few years. There was a blight on a great part of it last year, and although we had a very good crop it yielded very badly after it was threshed. There seemed to be weevil in the joint and midge in the grain. We grew Club, Red Fern, and Fife, and it seemed to be all affected in the same way. We have not grown it at all this year. Fall wheat is being grown more this year than it has been during the last two years. It has been a very good crop lately. I could not give any special reason for its success. Clawson is the principal variety grown; it seems to stand the winter and to grow better than other varieties.

THISTLES.—WEEDS.—DRAINAGE.

The principal weeds we have to contend with are Fox-Tail, or Summer Grass, and the Canada thistle. I have never seen wild oats or mustard to any extent. We have had Twitch Grass. I think the best way to get rid of the thistles is to let them grow well up, and then cut them down and plough the land. I do not think it is well to plough them until they are well grown up. We use turnips also to destroy the thistles. I have had a great deal of experience in the drainage of wet land on my farm. I think it pays very well to go into drainage, even for the thorough drainage of the driest portions of our land. If a man has wet lands and does not drain them, in my opinion, he might as well give up, because if crops are not put in early in the spring they do not come to much, and unless the land is drained they can't be put in early. I would put drains three feet below the surface; the main drain I would put a little deeper, of course. The depth depends a good deal on the kind of soil. The deeper the main drain is put the farther distance it will draw water from the sides. Drains do not do so well the first year as afterwards, or until the water begins to get a flow. I have used two-inch tile, but I would advise three-inch tile as being better; and if I had branches I would put in three-inch tiles, unless they were short, and in the main drain, larger, of course, than three-inch.

JOHN MILLER.

EVIDENCE OF MR. DRURY.

CHARLES DRURY, of Crown Hill, near Barrie, County of Simcoe, was called and examined.

To Mr. Dryden.—I was born on the farm I now cultivate, and I have followed the business of farming since I left school at the age of twenty-one. I have been engaged in mixed husbandry—grain growing and stock raising.

FALL AND SPRING WHEAT.

In my section, Clawson and Treadwell are the principal varieties of fall wheat grown, and spring Treadwell and White Russian are the principal varieties of spring
[*Mr. Drury.*]

wheat. The Clawson has been grown pretty extensively for four years; the Treadwell has been grown more or less for the last twelve years. Of the two varieties I prefer the Treadwell, although some are very much in favour of doing away with the use of Treadwell and adopting the Clawson. The spring Treadwell I have grown for four years. The White Russian is a new variety just coming into use in our section; but I think it will be the leading wheat for the next two or three years. With me the spring Treadwell has been more successful, however. I do not know any other name applied to this wheat; it is a bearded wheat and resembles fall wheat very much, being coarse, strong, and tall.

SPRING WHEAT A FAILURE.

My spring wheat has been a comparative failure for four years past; but the Treadwell of which I speak has not failed to so great an extent as the other varieties. According to my own observation, the failure of the spring wheat crop is characterized by the straw being weak and breaking down with ordinary rains, and by being attacked with a blight. During the last two or three years the whole of the wheat each year was destroyed in two or three days. We have not been able to explain the cause of this blight. The average yield of the spring Treadwell has been eighteen or twenty bushels to the acre up to last year, when I don't think it averaged more than twelve or fourteen.

FALL WHEAT—AVERAGE YIELD.

Fall wheat averages twenty-five bushels to the acre, but in 1879 the crop was not so good. So far as fall wheat is concerned I cannot observe any difference between the yield of one season and another during the last fourteen years. On my farm the highest yield was forty bushels to the acre, and the lowest eighteen, which I obtained last year. I have not used salt as a manure. Some of my neighbours have used it, but I cannot speak from personal knowledge as to whether it has been a cure for any of the ills of wheat or not. A neighbour assured me that it had partly cured the evil of the straw falling down, and I have been so much impressed with what I have heard in reference to it, that I purpose making use of it. I may confidently state that the yield of fall wheat is not decreasing in my neighbourhood; spring wheat has decreased to scarcely enough for seed in some cases. I presume that about seventy-five per cent. of the land now clear in my district is fit to be cultivated.

EFFECTS OF CLEARING THE LAND.

The clearing of the land of forests has undoubtedly made a difference in the growth of fall wheat. I have a field sown with fall wheat sheltered on two sides by a wood, and I venture to say that it is as fine a field of wheat as can be found anywhere in the whole Province. I attribute this solely to the protection from storm and wind afforded by the surrounding bush. Such a protection is especially valuable during a season like last winter, when we had very little snow on the ground.

FALL WHEAT ON FALLOW OR PEA STUBBLE.

I have never used a clover sod as a seed bed for fall wheat; I have never seen it used by anybody in my neighbourhood. About one-third of the fall wheat is sown on stubble land after peas, and about two-thirds on summer fallow after an oat crop. It is a very rare thing to sow wheat after barley. Fall wheat is usually sown on fallow or pea stubble. Spring wheat is sown after peas or roots, ploughed in the fall or spring. This is an almost universal custom in the northern part of the country to which I belong.

[*Mr. Drury.*]

USE OF PLASTER.

The only artificial fertilizer I have ever used is plaster. I use that principally on clover. I have not noticed its effect to last over to the grain crop on the following year, but I have noticed its effect on the grass crop. I have tried the experiment of covering part of a ten-acre field with plaster, and leaving the other part bare; and any one passing along one end of the field and looking down it could easily tell from the appearance of the hay where the plaster was sown and where the field was left without plaster. There was at least three or four inches difference in the height, and the hay grew stronger and more luxuriant. I put on the plaster about the second week in May. I think that the clover should be spreading over the ground before the plaster is sown.

COST OF RAISING SPRING AND FALL WHEAT.

I estimate the cost of raising an acre of fall wheat on a first-class fallow at \$21.10; which sum is made up as follows:—Interest on value of land, \$3; preparation of land for crop, \$9; seed, \$1.50; sowing and harvesting, \$2; threshing, \$1.60; manure, \$4. I include the labour in this estimate. In the preparation of the farm for the crop, I charge a first-class summer fallow, although it is scarcely fair to charge the whole fallow to the wheat, because the effect of that fallow is seen in the four succeeding crops; but I have not put it at a high figure, because we should have four ploughings and sixteen harrowings. For the raising of an acre of spring wheat, I estimate the cost at \$14.10, or \$7 less than the fall wheat, represented by the saving in the item of the preparation of the land.

METHOD OF SOWING.

At present in the northern part of the district where I live the larger portion of the wheat is sown by hand. In the southern part of the county the drill is almost universal. During the last season, however, all through that northern country a great many drills have been purchased, and the sowing has been done very largely by drill instead of by hand. By hand we sow a bushel and a half of fall wheat to the acre, and by drill a bushel and a quarter; of spring wheat, we sow by hand about a bushel and three pecks, and by drill a bushel and a half. I have had a pretty good opportunity during the last two years of noticing the effect of drilling upon the fall wheat, and I have observed that the fall wheat that was sown by drill came through the winter in better condition than that which was sown broadcast. Though I cannot speak from personal experience, I believe that in oats and wheat the use of the drill will produce a better yield.

MANURING A FALLOW.

When I am preparing to fallow a field, I put my barn-yard manure upon it the fall before, plough it under, and work it in during the next summer when I fallow. I do not know that this is the best way, but I do it then with the view of utilizing my time in the best way. I think the first crop grown on the land after that application receives the full benefit of the manure, and I have no hesitation in saying that you get the best results, so far as fall wheat is concerned.

VARIETIES OF WHEAT.

To Mr. Gibson.—The Scott wheat has been tried in our section, though I have not tried it myself. It is not liked very well, I believe. The Treadwell, taking it all in all, has been the best fall wheat we have had, and it is better liked by the millers and brings a better price than the Clawson.

[*Mr. Drury.*]

HESSIAN FLY—RENTAL—TURNIPS—MANURE.

To Mr. Malcolm.—There was a little damage done last year by the Hessian fly, both to the spring and the fall wheat, but more particularly to the spring. The weakness of the straw was not occasioned by it. You can trace the weakening of the straw to different causes altogether. I cannot say I know enough about the Scott wheat to urge any particular objection against it. One hundred acres of good cleared land would rent, I think, for \$300 a year, though I would not rent mine for that. I estimate a profit of about eight per cent. on the value of my farm. The ordinary value of a farm in my district is \$40 an acre. I raise a good many turnips. I manure my turnip land. I manage to have manure both for my turnip land and for fallowing. In that respect my circumstances are, I suppose, a little exceptional. I have 350 acres of land, of which about 200 acres are cleared, and I have kept a proportionately large quantity of stock, and all the manure they produced has been applied to the land. During the summer I leave the manure in the barn-yard. I have not tried manuring on the surface in the winter time.

To Mr. Whitelaw.—I usually manure pea stubble with barn-yard manure. After the peas are taken off, I plough under and sow. There are a variety of opinions about the Lost Nation wheat. I think it is a good wheat. I have seen the Russian and the Lost Nation wheats in the mill; I am doubtful if there is much difference between them. If the Clawson ripens it is a good wheat, but if it does not ripen properly, it is one that the miller does not care to buy, as it will not grind well. It does not stand the winter any better than others we have tried.

SPRING WHEAT CROPPING.

To Mr. Malcolm.—I don't think the Spring Treadwell is what is known as the Red River wheat. I don't know anything about the Arnautka by personal observation.

To Mr. McMillan.—I succeed very well in raising spring wheat after turnips. Our spring wheat altogether has been very poor, but we have had just as good results after roots as any other crops. I don't think the blight is caused by the land becoming impoverished; I think it is owing to some atmospheric influence. In one field of first-class land, where I expected to obtain thirty bushels to the acre, the blight came and I only got fourteen bushels. It has been just as bad in well-drained land as anywhere else. I have been very successful in raising peas, and have not been troubled with the bug.

To Mr. Byrne.—I have not discovered any remedy for the spring wheat blight. I have thought that I might overcome it by sowing in superior soil, but I tried that and did not succeed. I believe the use of salt has been beneficial to some extent. When salt has been used, there has not been so much trouble in the weakening of the straw; it becomes brighter and firmer, and the crop ripens better. The cut-worm has not attacked my spring wheat.

To Mr. Malcolm.—My soil is a clay loam.

FALL WHEAT AND THE FORESTS.

To Mr. Dymond.—In my earlier days the country was much more largely timbered than it is now. So far as my knowledge extends the yield of fall wheat averages now as much per acre as it did fourteen years ago, or when the land was first broken up. This result has been largely attained by the practice of making a good fallow, putting the manure of the year on that fallow, and sowing it with fall wheat. The average yield of fall wheat in my district has been twenty-five bushels to the acre, which I think is a fair average for the whole country. After taking into account everything a farmer does, and charging every expense he is put to, he will clear \$4 on that twenty-five bushels. The forests have not been cleared systematically in my district with a view to protecting the farmers' crops. The case I spoke of was accidental and not designed. Nothing has been done in the direction of replanting forest trees; no steps have been taken to consider the subject in any way. We do not think that we have reached the miserable condition which requires us to face that difficulty yet. We have more bush than there is in many parts of the West. Much

[*Mr. Drury.*]

less spring wheat has been sown this year than has been sown for twenty years past. Fall wheat is more generally grown than formerly. I think there is a universal tendency in my part of the country to raise more stock, in view of the export trade to Britain, than was formerly the case.

BARLEY GROWING.

To Mr. Dryden.—There is not much barley grown in the northern part of the County of Simcoe; it is grown more largely in the southern part. Barley, I have no doubt, is an exhausting plant, and takes out of the land more than twice as much food as is required for wheat. We came to the conclusion, as we heard that other portions of the country were producing fifty or sixty bushels of barley to the acre while we could only obtain thirty bushels, that we could not raise it profitably. Some farmers in our district will not raise more than twenty-five bushels. The barley falls very much in the same way as the spring wheat; the straw softens and breaks down with the blight. The usual practice is to sow barley after peas or roots; sometimes after fall wheat and after the ground has been carefully prepared and manured. Almost invariably the ground that has grown a root crop will be sown with spring wheat or barley. I think barley succeeds as well after a root crop as after wheat. I have not heard of any special fertilizers for barley. I don't think there is much difference between the cost of raising an acre of barley and an acre of spring wheat. There is a little difference in the cost of the seed; but I think the cost of raising an acre of barley is about \$13.20. I would not like to express any decided opinion, drawn from my own experience, as to the use of a drill for sowing. I was induced to use drills this year by parties who represented that there was great advantage in using the tube drill for all kinds of grain. The drill I use is so arranged that I can regulate the depth that I want to put my seed. There is undoubtedly some danger in planting barley too deep.

To Mr. Wilson.—The barley we sow is usually the six-rowed barley. We do not raise the two-rowed barley. I don't know of any difference in the product of the two kinds.

To Mr. Malcolm.—We usually sow grass seed with barley.

To Mr. McMillan.—We plough in the fall for our barley and wheat. We usually cultivate, and then plough again. If the soil is loose and open, we just cultivate and put the barley or wheat in; but if it is at all hard, we usually plough it up in the spring.

To Mr. Byrne.—We do not use any special fertilizer. I cannot say whether they are useful or not.

FALL WHEAT AND BARLEY.—FARM ACCOUNTS.—DRILL SEEDING.

To Mr. Dymond.—During the last four years I have realized about 60 cents on barley; that would be about \$18 per acre. Fall wheat would average \$1. That would be a profit of about \$5.00 an acre on barley, and \$4.00 an acre on fall wheat. The reason we do not cultivate barley largely is that we find we must fallow in order to rid the country of the thistles that are covering it, and if we do not fallow we cannot grow fall wheat. Besides, barley is a most exhausting crop to the land, so that even if we realize a larger profit upon it, it is a more expensive crop than fall wheat. As a rule the farmers in my district do not keep accounts; taking the farmers as a class I do not think there is one in a hundred that keeps any accounts at all. I do. The reason grain sown with a drill keeps better during the winter is that it is sown at a uniform depth, and seems therefore to have a better hold on the land and to resist better the heaving of the frost. Last winter, at any rate, the wheat sown with a drill was saved, while that sown broadcast was killed.

To Mr. Malcolm.—Observation has told me that barley is an exhausting crop, and I think there is a reason for it. It is laid down as a principle in botany that a plant with a narrow leaf and rapid growth draws its sustenance almost exclusively from the soil, while a plant with a larger leaf draws a portion of its sustenance from the atmosphere.

[*Mr. Drury.*]

OAT CROPPING.—RYE.

To Mr. Dryden.—I grow oats extensively; the yield is from thirty-five to forty bushels to the acre. It is a very reliable crop with us, though the oats have been struck with rust occasionally. It is an atmospheric evil altogether. I think the early sown oats are generally more reliable than the late sown. I think early sowing is the best for every kind of grain. Our season is a short one, and if the hot weather comes on before the plant has grown much, it hastens too rapidly to maturity. In the spring I would wait only till the land was dry enough, and I would then sow everything I could. The Norway is the most popular oat in our district. On the whole, within my recollection there has been rather a decrease in the yield. That has been attributable, I think, to poor tillage. We usually sow the oats as the closing crop of the rotation before we fallow, and I have no doubt that if the oat crop had a better chance, we would get a better yield. We principally sow our oats broadcast. This year I have sown everything with a tube drill. I sowed two bushels and a half broadcast to two bushels with the tube drill. The difference in the cost of raising an acre of oats, barley, and spring wheat is not much more, I think, than the difference in the cost of the seed. My estimate of the cost of raising an acre of oats is \$13. About forty bushels to the acre is a very good crop. We have been in the habit of supplying the lumbermen of the district north of us with oats. About 40 cents a bushel would be the average price obtained; some years it is down to 30 and others up to 50 cents. We get these prices because we are convenient to the lumber district. We could not get so much if we sent our oats to Toronto. We do not grow rye, except occasionally as a green crop to plough under.

PEAS.

We grow peas extensively, and the pea crop is found to be very profitable. The maximum yield of peas is about 30 bushels to the acre; the average would be probably 25 bushels. The Golden Vine is the principal variety grown. It is a small pea. We have not grown the Black or the Marrowfat pea to any great extent. The average price per bushel obtained for peas is about 55 cents. They go principally to England, and of course we compete with Toronto. This year I sold peas for 63 cents, which I think is a little above the average. I do not think there is any special course to be followed in preparing the ground for the pea crop. I put the cost of raising an acre of peas at \$13. The pea crop is generally sown on the spring ploughing. We have no failure in the pea crop except what is caused by unfavourable weather—occasionally too much rain. We have no mildew. Peas are the best crop we have. I have never seen a pea bug in our district. The pea crop is usually followed by wheat. The cultivation of the pea has a beneficial effect on the land; a heavy crop of peas leaves the land in as good a condition as a summer fallow. If the pea crop is a partial failure, it allows weeds and thistles to grow up; but I hold that a good crop of peas leaves the ground in as good or a better condition than it was in before it was sown. Peas ought, I think, certainly to be sown with drills, as they are better covered in that way than when sown by hand.

To Mr. Wilson.—I consider the black oat to be more productive than the white oat. It has a good straw and stands up very well. About every fourth year I should like to change my seed. I would prefer getting my seed from the north.

To Mr. Malcolm.—Oats, like barley, are an exhausting crop, and if I were renting my land, I do not think I would rent it to any person to grow a crop of oats at a less rate than for a crop of wheat. I would not say that peas increase the fertility of the soil, but they leave it in a fine, open, healthy condition, without exhausting its fertility. This I believe is owing to the fact that the peas have a large quantity of broad leaves, which draw a large amount of sustenance from the atmosphere. That is the theory, and the facts bear it out. A crop grown on pea stubble is superior to that grown on root crop.

To Mr. Whitelaw.—I think barley and oats are about equal in exhausting the land.

[*Mr. Drury.*]

THISTLES AND OTHER WEEDS.

To Mr. McMillan.—The Canada thistle is almost the only weed we have to contend against. We have no wild oats, or mustard, or pigeon weed. I consider barley to be more exhausting to the soil than wheat.

To Mr. Gibson.—If the tobacco plant is an exhausting plant and has a broad leaf, it is, perhaps, an exception to the rule I have mentioned. It is of little use to plough under a narrow-leaved plant, which draws all its substance from the ground, because it adds nothing to it; but a broad-leaved plant, which gathers its substance largely from the air, must be beneficial to the ground when ploughed under.

INDIAN CORN.—POTATOES.

To Mr. Dryden.—We do not grow Indian corn much. Potatoes are not very largely grown in my district; there have been more sown this year than ever before. We grow the Early Rose, the Late Rose, and to a limited extent, the Peerless, but principally the Early Rose. I think they will be superseded shortly by the Late Rose or some other new variety. The potato crop is a pretty successful one in our district. The potato bug made its appearance there first in 1874; but I do not think it is so destructive as formerly, and does not seem to be laying eggs so abundantly. There is no other insect enemy of the potato that we have to contend against. Sometimes the potatoes ripen too early on account of dry weather. There is usually a large surplus of potatoes in my township, which are sold principally to the lumbermen in the north. The principal other root crop we grow is the turnip.

ROOT CROPS.

We grow a few carrots for our horses, but we have not grown mangolds. We generally have a fair crop of turnips, unless the dry weather makes against the size of the roots; unfavourable weather is the only enemy of the turnips amongst us. I think probably 550 bushels to the acre would be the average we grow. Last year I raised a thousand bushels to the acre under exceptional circumstances. I think a root crop exhausts the land to a certain extent. It is not indispensable in a rotation of crops. But a farmer, when he wants to clean a portion of his land, instead of leaving it a naked fallow, naturally says to himself that if he can clean his land and obtain a quantity of roots for his cattle at the same time, he will do so. I find it almost essential to have some roots for my stock. Of course I have done without them, but I find that cattle do not thrive well unless they get some turnips every day. I have never estimated the cost of raising an acre of turnips. I usually sow as near to the 20th of June as possible. If you sow earlier the plants are apt to be injured by the fly, although the early sown roots are likely to be more solid than those sown late. A late sown turnip may attain to a good size, but it will not weigh so much or be so solid as one of an equal size sown earlier. I have never been troubled with turnips rotting; but generally speaking, an early sown turnip will keep better than one late sown.

POTATO PLANTING.—TURNIP FEEDING.

To Mr. Malcolm.—I plant my potatoes with a plough in every third furrow ten inches wide. I cut the seed, and always split it lengthways. If you cut it at random you may get the seed all on one side, and you will have lots of potatoes, but they will be crowded and small. Every morning we give all our stock a good feed of turnips before we give them any dry feed. After a feed of turnips the cattle relish dry feed, and eat more largely of it than if you fed the dry feed first and the turnips afterwards. For potatoes and turnips we use the ordinary barrow drill driven by hand. I sow about a pound of seed to the acre; but it is necessary to take into consideration the nature of the land. If it is rough, you may put on more—perhaps a pound and a half—and if the land is fine,

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and the seed likely to grow well, you may put on less. I think two pounds to the acre is too much.

To Mr. Byrne.—On the average, potatoes yield 160 bushels to the acre. There is no doubt the average has been reduced during the last few years by the use of Paris Green on the tops. I have fed them to cattle in some seasons; but I don't think they are any better than turnips, except for milch cows. They produce more milk, and milk with a better flavour. I find it advantageous to mix boiled potatoes with bran for milch cows.

PARIS GREEN.

To Mr. Malcolm.—I have applied Paris Green. The first two years I used it I mixed it with flour and land plaster in the proportion of about one to twenty. Last year I used it with water. I apply it by rubbing it through an ordinary tin dish punctured with holes like a sieve; when I use it with water, I put a large teaspoonful in a pail of water, and sprinkle it on the tops with a pine brush. But if you get Paris Green perfectly good, you need not use more than half that quantity.

SOILING SYSTEM.

To Mr. Dryden.—I have not adopted the soiling system to any extent. I have never grown corn or clover for the purpose. Practically speaking, the soiling system has not at all been adopted by my neighbours. I find a difficulty in the dry weather of obtaining enough pasture for my stock, and it is a growing difficulty; but I think that difficulty might be met by the adoption of the soiling system. The reason I have not adopted it is that I have a large swamp which has been surface drained; but if I were situated as my neighbours are, I would grow green crops to take the place of the dry feed of the pasture. I think the farmers are making a great mistake in not adopting it more largely than they are doing. There is not much land in my district used exclusively for pasture that could be ploughed profitably.

PERMANENT PASTURES.—ROTATIONS.

I don't think permanent pastures would succeed so well in this country as they do in the old country. The proper rotation of crops is, I think, after breaking up a sod first to sow oats, let that be followed by roots or fallow, then sow wheat, then peas, then barley, oats, or spring wheat, and then seed down with whatever may be required according to the circumstances. Many complain of an increasing difficulty in getting the seed to catch. I think that is owing to the soil becoming less fertile every year. Wheat and barley will grow about the same after a root crop; if you were seeding down in a field that had either peas or roots in the previous year, I don't think you would find much difference.

MANAGEMENT OF MANURE.

I find it most suitable to put on the manure in the fall, because I have the benefit of it for the wheat crop of next year. I have not adopted any special means for the preservation of my manure. I allow it to rot in the yard before applying it. Farmers generally pay no attention to caring for their manure, and especially the liquid portion of it. There is no general system of collecting it and spreading it on the fields. I usually draw it and put it in heaps on the land, so that it can be spread by hand just before ploughing. I have tried the plan of spreading the manure on the ground and leaving it without ploughing it under, but for wheat I think it is better to have it ploughed under, although I know that is contrary to the opinion of many. My swamp land contains fourteen or fifteen inches of muck. I have not tried to utilize that. I never felt the necessity of it, having a large stock. Wood ashes are used as a fertilizer to some extent in my district. I bought a quantity last fall at six cents a bushel, and applied it to the land before sowing fall wheat. I don't know what the result will be.

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RECUPERATION OF IMPOVERISHED LANDS.

I have not had experience in the improvement of impoverished lands, beyond paying attention to any field that was not yielding so well as I thought it should. I have not seen others trying experiments in that direction; but of course it is a question which will have to be faced by the people before very long. My experience has been somewhat out of the ordinary way, because I keep a large stock, and feeding this stock largely from the produce of land newly cleared, I have been able to keep up the fertility of the soil, and even to increase it during the last few years. If I wanted to recuperate the soil I would employ fallowing, and I would plough under green crops, and put on all the manure I could get. I have an idea that the cheapest plan would be to plough under green crops. If you cannot get clover, you can get rye, which is very good to plough under in the spring, and buckwheat, which will grow if there is hardly any fertility left in the soil. Peas, I think, are too valuable a crop to plough under.

To Mr. Wilson.—After leaving the manure for a few months in my barn-yard, I find it partly rotted, and a little green in the bottom. I would prefer to have it all rotted, but I can only accomplish that by turning it. If my farm was badly infested with weeds I would turn the manure to kill the seeds.

To Mr. Byrne.—If manure is in fair condition, is not too long and green, about twenty waggon loads per acre I consider a very good coat.

DIFFICULTIES WITH ROTATION.

To Mr. Dymond.—The system of rotation of crops is generally followed by the farmers in my neighbourhood. When you are carrying out a rotation, your calculations may be entirely thrown out if the seed fails to catch; then you hardly know what to do. I don't think the same difficulty occurs in England, owing, not to the higher state of cultivation of the land there, but to the better condition of the atmosphere for the growth of grass.

WASTFUL FARMING.—LEASES.

The cause of the impoverishment of farms in my district is that the farmers do not appear to realize the advantages of reserving a portion of their produce in order to improve the land. There are farmers who sell every bushel of grain they raise, except a few bushels to feed their horses on, all the hay they have got except what they *must* keep, and all their straw. They won't bring anything on the land, they keep two or three old scrub horses and cattle, and they will not put forty loads of manure on their whole farm. Some of these farms are mortgaged for far more than they will bring, and are being purchased by outsiders, the sons of settlers in the older parts of the Province, and English settlers who are coming in. Comparatively few farms in my district are rented. Those that are, are usually leased for five years. I know of one lease which has conditions as to the method of farming and the retaining on the land of certain quantities of the stuff grown; but I fancy as a rule there are no such conditions. When a man takes a farm on lease, his object is to get all he can out of it for the market.

To Mr. Byrne.—If a farmer follows the system of the rotation of crops, and keeps a certain quantity of stock, there is no danger of his farm running down. But a practical difficulty presents itself in this country. It is a difficult matter for a farmer to keep the quantity of stock that is necessary to enable him to maintain the fertility of his soil with barn-yard manure only; because if a man keeps that much stock, he cannot raise food enough for them, and is obliged to go on the market and buy. Without the favourable circumstances that surround myself it seems to me impossible for the ordinary farmer to keep that quantity of stock which will give him sufficient manure to keep up the quality of his land. His only hope is in first-class thoroughbred grades, from which he gets an income that does not force him to do injustice to his land. I think a man must have a little capital, in addition to the ordinary products of his farm, to renew the fertility of his land.

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Indian corn was used to a considerable extent for feeding purposes until within the last two or three years. I never attached very much importance to bran, except for milch cows.

UNDERDRAINING.

To Mr. Dryden.—I have paid considerable attention to drainage, although I have not gone into any general system of drainage. I have not been able to use tiles until within the last year. Wood and stone drains are what I have used. For wood drains I have used two inch scantling, with a six inch board at the top and bottom, except where the soil is hard and solid, in which case the bottom board is not needed. I never used any other kind of wood than pine. I have some stone drains which are about twenty inches broad, and about three feet two inches deep, a little deeper than the ordinary tile drain. I have not had any difficulty with these drains clogging. Most of the drains have a fair fall. I would not put in a stone drain where it would have a flat or sandy bottom. I have never put in any tile drains before this year. In one case I had a field that was unsafe for the stock to go into in certain seasons. I took that field, cleared the brush out of it, and grew several crops of hay, but it had always too much water. I drained it thoroughly, and the result is that it is better for the cattle than the higher land. Excessive moisture is not so bad for that field as for those where there are no drains. The water runs off, but there is no baked surface left behind; and the dry weather does not affect it so badly as it does the undrained fields. After having seen the results of my experiments in drainage, if I had to borrow money at ten per cent, I think it would pay me to drain my wet lands.

TILE DRAINAGE ACT.

I do not know of any in my district who have taken advantage of the Tile Drainage Act. I am of opinion that many of the farmers are not even aware that the fund exists. As reeve of the township in which I live, I have taken considerable pains to inform the people that there is such a fund, but so far we have not had any applications for money set apart by the Act for drainage purposes. My conviction is that the reason the farmers in my township do not avail themselves of the advantages of that Act is that they have not a proper understanding of the benefits it holds forth to them. From my observation, I find large quantities of the finest land we have in the country are wet lands, with a good clay subsoil; and I think if that land were drained, it would rank at once as the best land in the country. All these wet lands could be reclaimed and utilized at a very moderate expenditure for underdraining them. I think it would pay so well that if my farm needed draining, and I had to borrow money at ten per cent. and mortgage my farm to get it drained, I would do it. I think the Act expressly declares that the money lent for the purpose of drainage shall be a first lien upon the land, and many people are debarred from taking advantage of the fund by reason of having their farms already mortgaged.

To Mr. Byrne.—As to the length of time a wooden drain will last, this summer I inspected a drain which was laid in 1870, and I found the lumber sound. It was good pine lumber. The scantling for the side of the drain was 2 x 2 inches. The six inch board on the top and bottom just covers the whole, and leaves the size of the drain 2 x 2 inches. I think that drain will last for another ten years.

To Mr. Dymond.—The farmers in my township have not yet taken advantage of either the Act of 1878 entitled "An Act respecting investment in tile drainage debentures," or the Act passed in the subsequent year, extending its provisions to stone or timber drainage. On looking at the Act, I cannot discover any provision which makes the money lent for drainage purposes a first lien on the land. The only section bearing on that point, sub-Section 3 of Section 20, does not seem to bear that construction; this sub-section provides for the advance by the Government to a township being a first charge on the township funds. I have endeavoured as far as I could to bring the matter before my neighbouring farmers; but no other means, in the shape of township society meetings or

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otherwise, have been used for that purpose. We have a prosperous Township Association; but its whole aim is to get up as good a show and prize list as possible, and its annual meeting is entirely devoted to appointing Directors, etc., and no time is devoted to the discussion of such questions as the drainage of farms. We have grange societies also, which are a sort of club for the farmers, in my township.

IMPROVING STOCK.

To Mr. Dryden.—I am engaged to a considerable extent in stock raising. I keep good grade cattle, which I feed for the English market. I breed my own animals, though I would prefer purchasing and feeding if I could do so. In my breeding I always use thoroughbred male Shorthorns. Previous to the last three or four years there has not been much attention paid in my district to the use of thoroughbred animals. Previous to that time the farmers were willing to take what they could get so long as it was cheap, but since the English demand has sprung up people are willing to pay two or three dollars to have their cows served by thoroughbreds.

CATTLE FOR EXPORT.—SCRUBS AND GOOD GRADES CONTRASTED.

I sell my cattle for the export trade at the age of three years and upwards. Under favourable circumstances they will reach 1,600 pounds at the age of three years and six months. Within the last two years I have sold steers under four years old that weighed 1,800, or 1,900 pounds. I have been able to obtain five cents a pound for such cattle; but the high rates for freight are against us. I have had experience in feeding common bred scrub steers. I bought some native steers of a good average sample and fed them along with some of my own raising; and these native steers were sold at a somewhat less price per pound, and while the steers of my own raising weighed 1,600 or 1,700 pounds, the best of these native steers went only 1,300 pounds. They were all treated alike from the time I got them, receiving the same pasture and the same feed, and I think they consumed about equal quantities.

MANAGEMENT OF CALVES.

I aim to have my calves dropped about the last of March or the first of April. I take them right away from the dam at once, and never let them suck at all. I wean them and milk the cow, feeding the calf for seven weeks on new milk. I do not add anything during that time to the milk, and I give them all the milk they will take. I believe that is a more economical plan than to allow the calves to follow the dam. If you allow a calf to run with the dam, the running about is likely to keep it poor. At the end of seven weeks I feed the calves skim milk. I do not wean them suddenly, but give them a feed of new milk occasionally before finally weaning them in order to accustom them to the change. Sometimes the change will result in scouring, and I think it well to give them ground flaxseed boiled with the milk. When the cold weather comes on I give them ground oats, pea meal, hay, grass, or something of that kind. In the winter time I tie the calves up; but before that I let them out into a grass plot from the time they are weaned from the new milk, which generally takes about six weeks. When they are tied up I let them run out for exercise every day for about three hours. In the winter time my method is to give the calves the first thing in the morning a good feed of turnips. I begin with a little less than a peck, and I go on increasing the quantity as they grow. After the turnips they get hay; I save the best and finest quality of clover hay for the growing calves. In the evening they get, instead of roots, pea meal, ground fine and mixed with chaff, and at nine o'clock at night they get a feed of clover hay again. After a calf is a year old I do not think it necessary to give it grain, provided it has good pasture. In the fall of that year it will come in in first class condition and very hardy, so that you can keep it in good growing order for the winter. In feeding flax meal, great care must be taken to find what quantity a calf will do with. Sometimes a calf will get scouring by having too much. But if this is guarded

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against, you can keep the calves in good growing condition right along. Occasionally I find a calf that will not take the flax seed meal, even when it is put in the milk, and then I let it wait until it will take it. Sometimes they have also to be educated to ground oats and peas; but when once they take to this kind of feed, they will never lose track of it. I have been in the habit of selling my cattle to the local butcher for Christmas; but now I prefer selling for the export trade. I aim to have the cattle ready to go at any time between Christmas and the spring, so that I can sell them whenever the market suits and the buyer comes along ready to pay a good price. Cattle are the only stock I breed to any extent.

BREEDING COWS—CALVES.

To Mr. Malcolm.—My breeding cows are grade Durhams. They are large fine cows, and some of them, I believe, are entitled to registration. I usually give a calf a pint of pure flax seed meal a day. I am in favour of keeping calves in good condition from the very first. I do not value bran very highly as a fattening food. It is very good to mix with stronger food in order to give bulk, but there is not much fattening quality in it.

To Mr. Whitelaw.—The principal objection to selling to the local butchers is that they do not pay cash. At Christmas there is a fair demand in the town for from fifteen to twenty cattle; but the demand is so small that one man may sell a few cattle at good prices, and supply the whole town. During the second winter I do not find it necessary to feed the calves meal, but I feed them roots and hay, and all the chaff they want. I give them roots once a day—in the morning—and hay twice a day. In the last spring before they go out to grass, I feed them meal for perhaps a month or six weeks, and then send them to grass. When the grass commences to fail I bring them in and stall-feed them with pea meal, turnips, and hay, or something of that kind. That would be about the middle of October. I think the best market is about Easter time. In feeding I endeavour to find the capacity of the animal, and give him just what he is able to stand. It is a very rare thing that you have to feed more than a gallon of pea meal twice a day. I usually feed it dry with chaff. I consider five cents a pound for 1,600 pounds a good price; that would be \$80.

FEEDING MORE PROFITABLE THAN BREEDING.

To Mr. McMillan.—If I could get the proper quality of steers, I think it would pay me better to buy and feed them than to breed them myself; but I find that the men who have them will not listen to any proposition to sell. The natives can be bought as cheaply as you like. If we had a field to buy from, we could certainly feed more profitably than we can raise our own calves here. When I travelled through the Western States in 1875, I did not see so desirable a class of young cattle as I believe they have now. If I had the same quality of cattle which I have seen passing through here, from the Western States to the seaboard, I could make more money by feeding them on my farm than by raising the same class of steers from calves.

OBJECT IN RAISING CATTLE—WINTER MANAGEMENT.

To Mr. Byrne.—My object in raising cattle is to improve the land and make money out of the stock. My cattle have been bred from among the first imported stock in the Province. The original stock was brought from Yorkshire, England, in 1836, and the owner of that stock was a near neighbour of mine. My cattle have been bred to the same strain, with occasional changes, for a succession of years, so that I could not say how many crosses are necessary to produce the cattle I speak of. In the winter time I keep my young cattle tied in boxes, giving them plenty of room—putting perhaps two in a box. In keeping cattle in this way, you have to be very careful and attentive. You have to visit them at stated times to see that they are all right, to remove the muck, and give them fresh straw. It is cheaper to keep them tied up than to let them run in open sheds. I have usually been in the habit of letting my heifers run till they are three years old be-

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fore putting them to the bull; but I think two years old is perhaps a better time. I do not keep my breeding cows in fat or high condition, but simply in a good thrifty condition. I have not found any difficulty in getting the cows to breed. They are successful in nearly every case. I have never had a solitary case of abortion that I know of.

PROFIT OF GRADES OVER SCRUB ANIMALS.

To Mr. Dymond.—I agree with Mr. Hobson in the opinion expressed by him that the sum realized for a well-bred steer at three years old would be \$30 or \$32 more than the sum realized for a common or scrub animal at the same age. I agree also with Mr. Clay as to the advantage of feeding animals for the market instead of raising them ourselves. If we were able to buy the right class of young animals we could feed them during our long winters, and the result would be profitable to the farmer in the improvement of his land.

CORN AS CATTLE FEED.

On several occasions our cattle have been saved from starvation by feeding them Indian corn. This was rendered necessary either by the failure of the hay crop, or by unusually long winters; but I prefer peas to corn for feeding purposes—that is, if I could get a bushel of corn for sixty cents, and a bushel of peas for sixty cents, I would take the peas. In 1877, when the pea crop failed, corn was brought in in very large quantities, and was sold very cheaply as a substitute for peas. At that time, I think, we were giving forty cents a bushel wholesale for corn. In our section of country we have had a remarkably good crop of peas, and there never has been the same occasion for the use of corn; it may be, also, that peas are relatively cheaper than corn. If corn were forty-seven cents a bushel, I think it would be a little cheaper than peas at their present price. I don't think we have handled American corn for feeding purposes since two years ago last spring.

FARM LABOUR—WAGES.

To Mr. Dryden.—With reference to the subject of farm labour, I depend partly on hired labour on my farm; but I have not so much need for it now as I had formerly, because I am doing business in partnership with my brother. At present I have three or four men. I have one man whom I employ nearly the whole year. He lives on the corner of my place, and when he cannot get work anywhere else he comes to me and gets it. At certain times there are plenty of men, but when the rush comes, and everybody wants men, they can't be got. My own theory is that we should keep a man all the year round, and give him moderate wages and a comfortable home, and I purpose doing that. It would be both advisable from the farmer's point of view, and more just to the man. When the labour is cheap, and there is plenty of work, we all want men; but when the rush is over we dismiss them. The rate paid by the year is from \$130 to \$140, with board. Those employed during the summer are paid from \$14 to \$15 a month. I am sure ordinary farmers would gain an advantage by employing more hands on their farms. I believe it would pay to employ them permanently, as profitable work can at all times be found on the farm for a man. A comparison between the immigrant and the native labourer would be favourable to the immigrant in some respects, and unfavourable in others. The immigrant is slower, but he is more comfortable to get along with than the native labourer. He does not expect so much from the hands of his employer as many of our native born men do. He is more accustomed to the position of a servant. I have not found the introduction of machinery to be an obstacle to the employment of labour on the farm. The farmers in my neighbourhood ordinarily use these machines. I think the machines meet the requirements of ordinary agriculture in this country. With reference to keeping accounts, I have not adopted an elaborate system of book-keeping, but I enter every dollar that I receive or pay out, and I can tell at the end of

[*Mr. Drury.*]

the year precisely how I stand, whether I have made or lost anything. I also make it a point, before entering upon any particular branch of business, to calculate as closely as I can what the result will be.

To Mr. Byrne.—In the second or third year I don't think the immigrant labourer is so good as the native man. I would give a Canadian labourer two or three dollars a month more than an immigrant; the former is more active, and will do more work than the latter. An old country labourer does not seem to take in the situation and see how important it is when bad weather is coming for every one to strain his nerve to prepare for it.

AMOUNT OF LABOUR NECESSARY.

To Mr. Dymond.—I think an ordinary farm of 150 acres, apart from the haying and harvesting season, should have three men regularly employed to attend to the business. The farmers in my district have not that proportion. I think there is hardly a farmer there who could not employ additional labour profitably and advantageously. A very comfortable frame house of four rooms and suitable for a labourer could be erected for about \$275. The labourers in my neighbourhood find some work during the winter in the lumber shanties; though during the last year or two it has not been so easy to find employment as formerly.

OLD COUNTRY IMMIGRANTS.

The immigrant labourer improves after a time, and accustoms himself to his position. Many a man who in the old country expected to be nothing more than a labourer all his life, when in this country for a short time, becomes spurred up with the idea that he will in four or five years be able to get some land of his own; and as soon as he becomes imbued with that idea, he is a better man for his employer.

FARM ACCOUNTS.

I think some better system of accounts than that which I have described could be adopted by the farmers, though I should hardly presume to suggest to this Commission any particular plan. The result of my book-keeping is that at the end of the year I can tell precisely what every particular crop which I have raised has cost me to produce it, and what I receive for it, so that I know at once the difference between the two. I take stock annually—not as a merchant does, but sufficiently to show me how I stand. I keep a cash account, but not a ledger.

WAGES IN ENGLAND.

To Mr. Dryden.—I do not see much difference among the immigrants that come from England, Ireland, and Scotland. In 1872, when travelling through England, I learned why the labourers were not suitable to this country. In the south they were receiving eleven shillings a week, and in the north twelve or thirteen shillings. There was nothing to induce these men to make any push or exertion. There were plenty of men at work, but I speedily saw that they were moving about like mere machines simply to put in the time. I think a man could carry on a 400 acre farm at comparatively less expense than a smaller farm.

CHARLES DRURY.

[*Mr. Drury.*]

MR. DICKSON'S EVIDENCE.

JAMES DICKSON, of Tuckersmith, county of Huron, was called and examined.

To Mr Dryden.—I am at present the Registrar of the county of Huron. I have not been engaged practically at farming for twenty-nine years; but I followed the business of farming formerly. I came to this country forty-seven years ago, and settled in the county of Huron. I helped to clear up the country, and have been more or less connected with farming ever since.

STOCK RAISING.—SHORTHORNS.—GRADES.

My attention has been paid to mixed husbandry. At present I have a few thoroughbred Durham cattle and several Durham grades; I have also devoted some attention to sheep. About five years ago I went into breeding pure Durham stock to sell to the farmers; previous to that time I was breeding and fattening grade cattle for the market. I purchased my first Durham bull at the Provincial Show held at Brantford in 1857. At the present time, besides selling pure Shorthorns to the farmers, I devote some attention to feeding grade stock to supply the foreign demand. The extent of my farm is 200 acres. I can send away five or six head of fat grade cattle a year. In the main my experience has been exactly the same as that of Mr. Drury in raising grade stock.

CORN MEAL.—OIL CAKE.—THE PEA CROP.

The only difference is that we give the cattle oil cake ground, and we use corn meal now, since the failure of the pea crop. The pea bug seemed to begin its ravages in the southern counties, and it is gradually working north. I have no doubt they will get a taste of it in Simcoe by and by. Last year the pea crop completely failed with me, and this year I have not sown a bushel, in the hope that the pest may die out. I have paid 60 cents a bushel this year for corn delivered at Seaforth, which price includes the duty of 7 cents per bushel.

CHOICE OF STOCK.

The families of Shorthorns which I have been breeding are partly Bates, partly Booths, and a mixture of both. I have not bred long enough to be able to say whether it is better to mix them or to keep them separate. In breeding, I choose my stock partly for pedigree and partly for individual excellence. The farmers in my section have become decidedly more in favour of using a better class of animals since the demand for the old country market has sprung up. This year I sold five thoroughbred young bulls, from ten to fifteen months old, at an average price of a little over a hundred dollars.

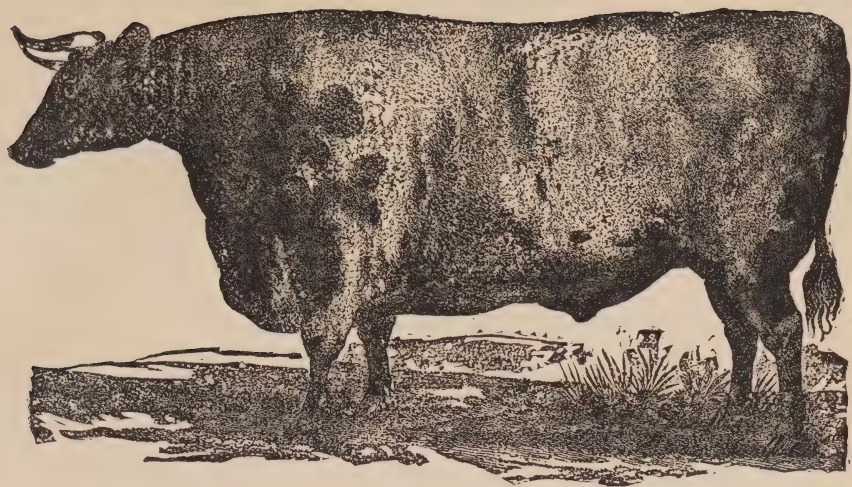
BEEFING CATTLE.

Some time ago I sold two grade steers at three years and six months old, weighing 3,550 pounds, for 7 cents a pound, and I have got $6\frac{1}{2}$ cents a pound for four-year-old steers. What I desire, however, is to obtain an animal for the old country market as early as possible, say up to twenty-seven or thirty months old, because up to that age they will gain more weight per day than they will afterwards. There is no doubt that good grade Durham stock is just what the country requires, and particularly the county of Huron and other counties having the same soil and climate.

To Mr Byrne.—I have not fattened any thoroughbreds yet. If you get a very good grade, it is difficult to distinguish it from a thoroughbred. I am quite satisfied with my experience of keeping thoroughbred cattle, so far as it has gone.

To Mr. Dryden.—I have noticed a difference in the quality of different thoroughbred animals. A farmer in buying ought to have a registered pedigree, but he ought to have a good beast also.

[*Mr. Dickson.*]



KETTON OX.



SHORT-HORN HEIFER.

GRADE DURHAMS FOR MILKERS.

To Mr. McMillan.—I have found some grade cows to be exceedingly good for milking. I have at present three thoroughbred Durhams which are very deep milkers. I have not tested the Ayrshires for milking purposes. My grade calves are fed from a pail with milk and boiled linseed. The thoroughbred calves suck, and they get a mixture of corn, oat, and barley meal three times a day, together with a plentiful supply of hay and roots in winter, and clover and green corn in summer.

GRADE CATTLE AT THREE YEARS.

To Mr. Malcolm.—In raising grade cattle for the old country market, I desire to have the calves come as soon after the beginning of the year as possible—in January or February. I think they should be ready for the market at not later than three years and three months old; but I think we ought to try and have them ready when they are two years and three months old. A farmer in my neighbourhood has sold grade cattle for several years at that age, and they averaged 1,200 lbs. I think they pay better to be sold then at that weight than to be kept for another year and to weigh 1,500 lbs. I think they would sell at about the same price per pound. In raising cattle a great deal of tact and skill are required from the very first. I think our agricultural societies make a mistake in not giving prizes for steer calves.

To Mr. Wilson.—All that an ordinary farmer requires to improve his stock is to have a good thoroughbred bull. That remark applies to cattle both for beef and for dairy purposes.

To Mr. McMillan.—Those who are living in sections where they cannot grow peas owing to the bug are put at a disadvantage as compared with cattle breeders in other sections, in consequence of the duty on corn.

IMPROVEMENT OF LOCAL STOCK.

To Mr. Dymond.—I brought the first thoroughbred bull into that part of the country where I live. There has been a general improvement in the cattle of that district in consequence of the introduction of thoroughbred stock. The farmers are devoting more attention to stock raising than formerly. A steer from the first cross upon a good native cow is a good article for the English market, but there is no objection to two or three crosses. I do not think there is any difference in the cost of bringing up animals of the first cross and those more nearly thoroughbred. If farmers could get the proper sort of animals, I think it would pay them better to purchase young cattle and feed them for the market; but I think it is impossible for them to get the right class of animals. Ordinary farmers about me, with farms of 100 acres, probably keep from four to seven cows on the average. Sometimes two or three unite to get a thoroughbred bull; but, as a rule, they depend very much on bulls advertised for service. I am not aware of any bulls being used this season in my neighbourhood that are not thoroughbred.

To Mr. Malcolm.—I heard part of Mr. Snell's evidence. I do not agree with him that it would be wise for ordinary farmers to go into the breeding of thoroughbreds. The great majority of farmers could not afford to purchase cows of a high enough quality to breed that kind of stock. They can buy bulls very well at from \$100 to \$200, and after the service of that animal, they can fatten him, and they will sometimes get considerably more than half what they paid for him originally.

GRAIN CROPPING.—WHEAT.

To Mr. Dryden.—The varieties of grain we depend on in our section are wheat, barley, oats, and peas, but the pea crop was a failure last year. We grow both spring and fall wheat; but latterly there has been more fall wheat raised than spring wheat. The

[*Mr Dickson.*]

spring wheat has failed from a variety of causes such as blight, midge, and so forth. The fall wheat has done exceedingly well for the last two or three years, and this year a very large acreage of it has been sown in the county of Huron. I cannot give the reason why fall wheat is more productive and a surer crop now than it was a few years ago. The varieties of spring wheat grown now are principally the Lost Nation, which some people call the White Russian, and the White Fyfe. I don't know Spring Treadwell by that name. I have used salt largely in the growing of wheat, and have found that it stiffens the straw, and makes it brighter in colour. It has in a great measure stopped the tendency of the straw to break down. I cannot speak as to its effect on the quality of the grain. Last year my Lost Nation wheat crop was injured a good deal by the midge, although it stood well to the harvest. It yielded twenty-three and a half bushels to the acre of clean seed wheat, all of which was sold to the farmers. My White Fyfe last year did not yield more than seventeen bushels to the acre of clean seed wheat. Both sorts were grown after a turnip crop on clean, rich soil. About three years ago we used to raise from twenty-eight to thirty-three bushels to the acre of the Red Chaff spring wheat on such land; but we can't raise it now.

LAND FOR FALL WHEAT.

We generally sow fall wheat on land which has been some time in pasture. We plough that in the spring—even up to the month of June—then work it well with the cultivator or gang plow during the summer, put the manure on it, and then plough it for the seed bed. The farmers in my district generally do not use any artificial manure besides salt. I have not used anything else, except superphosphates for turnips. It was only as an experiment, and my success was not sufficiently great to warrant me in buying any more. I think fall wheat stands the winter best by being sown with a tube drill; the seed is at a greater and more uniform depth, and is not so likely to be injured by the frost. A smaller quantity of seed will do with the seed drill than when sown broadcast.

BARLEY.—COST OF WHEAT PER ACRE.—PEAS.

I do not sow barley extensively, though it has been a fairly successful crop in our district. I have not estimated what it costs to grow an acre of wheat. I thought Mr. Drury's estimate was perhaps 20 per cent. higher than I would have stated with regard to fall wheat. The farmers in my district have ceased growing peas almost altogether. I used to get 50 per cent. more for black eyed Marrowfat peas than for any others. Before the pea bug came I raised thirty bushels to the acre. Latterly the bug became so bad that there was scarcely a pea that had not a bug in it. I may state that I received the first prize for the best two bushels of black eyed Marrowfat peas at the Provincial Show in 1877.

To Mr. Malcolm.—I have had no experience of the Hessian fly.

SALT AS MANURE—SOIL—BAD MANAGEMENT.

To Mr. Byrne.—The usual quantity of salt I sow is about 300 pounds to the acre but I have seen as much as 400 pounds sown. Our soil is a rich clay loam, not very heavy. Some of the farms are getting impoverished through bad management. Ploughing under some green crop would perhaps restore such farms to fertility as quickly as anything else. Corn meal is probably as good or better feed for cattle in winter than any of the other grains; but I would prefer a mixture of oats and peas in the summer time. I think the oats and peas will produce a larger animal than the corn.

[Mr. Dickson.]

YIELD OF FALL WHEAT.

To Mr. Dymond.—Salt is very cheap in our district. My sons manage my farm, and I only go there now and again. The average yield of fall wheat has, I think, been as good of late years as when the country was newly settled; the average is about 25 or 30 bushels to the acre. In 1878 my Clawson wheat yielded 40 bushels to the acre. My estimate of the profits of fall wheat farming would be three or four dollars higher than Mr. Drury's.

To Mr. Gibson.—The most productive fall wheat at present is the Clawson. We grow the Scott wheat also, which has, I think, proved to be the most hardy, but it has not yielded so much per acre as the Clawson. I have heard it stated that the Clawson wheat does not mill so well as the Scott—that it makes a softer flour.

ROOT CROPS—CATTLE FEED

To Mr. Dryden.—I grow from eight to ten acres of root crops a year—carrots, man-golds, and swede turnips. I depend chiefly on the turnips as a food supply for my cattle. The turnip crop is a tolerably certain crop. The fly sometimes does considerable damage. Generally the farmers sow from the 15th to 20th June. Early sown turnips are most likely to be attacked by the fly. The average yield of turnips is from 600 to 800 bushels per acre; there may be some instances in which the yield is greater than that. The way I prepare my cattle feed is this:—twice a week, in the winter time, we take the horse-power and cut oat straw or wheat straw and hay in about equal quantities and mix this feed with pulped turnips and a little bran. It is then allowed to ferment. When fed to the cattle a little corn or other meal is added. This is used for fattening grade cattle and also for thoroughbred cattle. For the summer time we have partially adopted the soiling system, and have generally grown corn for that purpose. We commence to use it about the middle of July, when the pasture begins to get dry. I think it would pay ordinary farmers well to adopt the soiling system. In our district some try to carry out the rotation of crops, but it is rather difficult, owing to the failure of the clover crop occasionally. It is not customary among the farmers in my neighbourhood to take particular care of their barn-yard manure. No particular pains are taken to save the liquid manure, or to rot the manure. The manure is generally applied by the end of May or the beginning of June for the root crop.

To Mr. Dymond.—The farmers find the careful and warm housing of their cattle in the winter time to be profitable. There are no farmers in my neighbourhood carrying on large farms for experimental purposes.

PRIZES AT SHOWS.

To Mr. Malcolm.—I have exhibited thoroughbreds at the shows, and have been pretty successful. My opinion is that it is a mistake to give a large amount of prizes for Devons, Galloways, and such like, at Provincial and other shows every year. I look upon the Durham as the best animal for this country. When at the Experimental Farm the day before yesterday, I made inquiry as to the growth of the different animals, and I was told that the Durhams up to three years old invariably beat the Herefords, and that after that the Herefords increased in weight. If that is the case, the Durham has decidedly the advantage, because it is early maturity that we want.

To Mr. Dymond.—We have had farmers' clubs for the discussion of various matters, but they are getting out of fashion again. I have not made trial of any other breeds than the Durhams. I would not give prizes for other classes of animals to the same extent as the Durhams at the Provincial shows. I think it is a loss to the country to raise other classes, such as Herefords and Galloways.

[*Mr. Dickson.*]

STOCK LAWS—PLANTING.

To Mr. Malcolm.—I think it is very desirable that cattle should not be allowed to run at large on the roads, if a law could be passed to prevent them.

To Mr. Dymond.—If there is such a law it has not been put in force in my district. Some kinds of animals are prohibited by by-law from running on the roads, such as horses and hogs. I have sometimes thought that many of our young farmers could be retained on the farms, if their homes were made more attractive than they generally are, by the planting of shade and ornamental trees, keeping a little bit of lawn with a few flower beds tastefully arranged, and so forth. Not much has been done in the way of tree planting in my district. The municipalities have done nothing to encourage the planting of trees along the roads, and none of the farmers have undertaken tree planting except in a few cases for ornament. There may be from ten to twenty acres of the original bush yet standing on some of the hundred acre farms. The want of trees, I think, allows the wind to blow the snow off the fields in the winter, so that the wheat in some winters gets seriously injured by the frost. I think it might be well to have elementary agriculture taught in the schools.

FARMERS' SONS—FARM ACCOUNTS—LABOUR.

To Mr. Whitelaw.—I think the keeping of good stock would tend in the direction of encouraging the youth to remain on the farms.

To Mr. Dymond.—The farmers in my district generally do not keep accounts.

To Mr. McMillan.—With regard to hired farm hands, for real steady work, I think I would just as soon have an old country man as a native Canadian. In saying I prefer the Durham cattle I of course refer to the county of Huron particularly, and counties similarly circumstanced as to climate and soil. There may be other sections where other classes of cattle will thrive as well as the Durham. I have had a good deal of experience in drainage, and I think it would pay well for farmers to drain their lands.

UNDER-DRAINING.

To Mr. Malcolm.—The most economical depth for drainage is, I think, three feet. The great trouble with us is to get rid of the water rapidly enough during thunder storms which come so suddenly upon us. I have used tile and hemlock drains. I have one large drain made out of hemlock plank a foot in width, which has been used for fifteen years, and will stand ten years yet. Latterly, I have been draining entirely with one and a quarter and one and a half inch plank. I usually make my drains with two sides and the top, and merely put strips across the bottom to keep the sides in place. My drainage has produced excellent results; the wet land which has been drained is the finest land on the farm. In the land with a clay bottom like ours, you can grow one-third more when it is drained than you can if it is not drained. Cedar drains, I think, will last longer than any other wooden drain. There are considerable quantities of land in my district that ought to be drained. None of the farmers that I am aware of have availed themselves of Government aid for drainage. I don't think they need it.

JAMES DICKSON.

MR. BENSON'S EVIDENCE.

W. T. BENSON, of Cardinal, county of Grenville, Ont., was called and examined.

AN EXTENSIVE STOCK FARM.

To Mr. Dymond.—I have a stock farm of about a thousand acres in the township of Edwardsburg, county of Grenville, and I am engaged largely in the breeding of Shorthorn cattle. I don't care about raising grain, except to recuperate the meadows. I have a herd of thoroughbreds for breeding purposes. I used to have a herd of Ayrshires and a herd of Shorthorns and fatted cattle as well, but now I confine myself to thoroughbred Shorthorns, and I have from one hundred to one hundred and fifty steers. I buy the steers for fattening. If I have any bull that does not look very nice, though thoroughbred, I castrate it and kill it as a steer. I have not lately raised steers by crossing common cattle with thoroughbred bulls. My father owned an estate in England, and ever since I was a boy I have been amongst animals; and when I came to this country I fed cattle for a number of years, and I have been breeding Shorthorn thoroughbreds here for eleven years. My acquaintance with farming and stock raising has been during all my life. I have been twenty-two years in Canada, and have fed cattle for twenty years, and also raised cattle, but I have only been raising registered Shorthorns for eleven years. I came from Westmoreland, England.

SLOW LOCAL IMPROVEMENT.

To Mr. Malcolm.—The stock of cattle in my neighbourhood has been only very slightly improved by the use of thoroughbred Shorthorns. I have given the farmers the opportunity of putting their cows to my thoroughbred bulls, but I have never got paid for the service of one. A few times, when they obtained the use of a bull, they said the cow had not conceived. Although I only charged three dollars for service, they would not pay it. I have always had bulls for sale, and I think, with the exception of three instances, I never sold any bulls in the neighbourhood, although they were offered very cheap. Some of the farmers put their cows to the bull, but in every case they said they never caught, although it was a very sure bull.

CONTRABAND "SERVICE."

I may have improved the stock of the neighbourhood this way: I used to run yearling bulls in the fields, and my neighbours would pull down the fences at night and let these bulls in among their cattle, so that in that way their stock may have been improved. In the same way the village cows have been improved. At one time I had a large herd of thoroughbreds, but I sold forty at one time, and now I have only about thirty females left.

STEERS FROM THE WEST.

There are no steers raised in my neighbourhood at all fit for shipment to England; we have to get them entirely from the west. All the steers which I am fattening on my farm have come from the shores of Lake Huron. The farmers in my neighbourhood see that there is an opening for the sale of good cattle, but they won't pay the price of a good bull. I have offered young bulls at twenty-five dollars when they were first dropped from cows with fourteen or fifteen crosses from imported stock, and sired by a son of the second Duke of Hillhurst, which was Mr. Cochrane's bull, and they would not buy them; so that I have sold very few bulls in the Province, except by auction. Practically there has been no increase in my neighbourhood during the last two or three years in the use of thoroughbred bulls.

[*Mr. Benson.*]

THE SHORTHORN PREFERRED.

For improving the common stock of the country I like the Shorthorns. I have never tried Herefords. I think Shorthorn beef is as good beef as you need want, and prefer the Shorthorn for farmers' use. I have kept distinct herds of Ayrshires and Shorthorns, and I have crossed the bulls of both breeds on the common stock, and I like the cross from the Shorthorn very much the better, even for milking purposes. For the necessities of the country, I think the Shorthorns are altogether the best cattle, and therefore if you wish to encourage what is best for the country, I think the agricultural societies should give the highest premiums to the Shorthorns. I do not think that the Devon, owing to its smallness, is the animal for us. Its beef may be very good, but the shippers will not buy anything that is small, as the same rate is charged for shipping a small animal as a large one, and the large animal therefore decreases the percentage cost of shipment. Still, I should be sorry to see the Devons become extinct in this country. I have had no experience with the Jerseys for dairy purposes.

MILKING QUALITIES.

I have had a great many cows passing through my hands, and I have never bred a common cow to a Shorthorn bull unless it was an extra cow; in that way I have only crossed the pick of the native cows, some with Shorthorns and some with Ayrshires. I never found the cross from the Ayrshire to milk better than the cross from the Shorthorn, and with the Shorthorn cross you have the additional advantage of having a large animal which, apart from its milking properties, you can fatten for beef. The milking quality of a cow is a little arbitrary. I have sometimes expected good results from breeding cows from an Ayrshire bull, and have not had my expectations realized. Taking meat and milk together, I think the Shorthorn cross is the best. The milk coming from the Shorthorn is, I think, more suitable for general purposes than the milk from the Ayrshire. The Ayrshire is a capital cow for cheese, as the Jersey is for butter, but I think the Shorthorn combines a little of both qualities.

EARLY MATURITY.

A thoroughbred will mature earlier than a cross, if it is well fed; but, unfortunately, our farmers feed so badly that they stunt almost the best animal. If they found that they would have to produce animals of a good size to obtain a market, they could do so by using the Shorthorn. A common animal is worth nothing at all for shipment. When fattened, it is only worth about four cents a pound, while the Shorthorn is worth five to six. A Shorthorn thoroughbred or grade, at three years old, would weigh from 1,400 to 1,600 pounds, while a common animal at the same age and on the same kind of treatment would not weigh more than about 1,100 pounds. Estimating that the one weighed 1,400 pounds and was sold at five and a quarter cents a pound, and that the other weighed 1,100 pounds and was sold at four cents a pound, there would be a difference in the sums realized of about thirty dollars. In the raising, the high bred animal might eat a little more, but it would be very little, and the attention would be very much the same in both cases, only if you did not feed them at all or pay any attention to them, the common animal might do a little better than the Shorthorn. The farmers have not taken the trouble to test the difference between the two. They use miserable scrub bulls, which are utterly useless for stock breeding purposes, and seem to be content with them.

COST OF FATTENING.

I cannot tell you the cost of raising cattle; I can only tell the cost of fattening. A good three-year old animal, weighing 1,150 pounds, would cost in the fall about
[Mr. Benson.]



GROUP OF THOROUGHBREDS.

three cents a pound—\$34.50. I have never been able to make a profit from feeding with grain; I cannot compete with Mr. Wiser in his distillery feeding. I might make a profit at six cents a pound, but I cannot at five cents.

SAWDUST FOR BEDDING.

I bed my cattle on sawdust, which is an absorbent, and makes a vast pile of manure. The sawdust I use is not common sawdust from a sawmill; it is sawdust and the shavings from seasoned lumber. It comes from a stove factory and a box factory, and the whole of the lumber is kiln-dried, and the sawdust, therefore, absorbs all the moisture that comes from the cattle more rapidly than straw. I never use pine or cedar sawdust, because it is difficult to rot; but I confine myself to the use of basswood and elm, which decompose quickly. Very few people have equal facilities for getting such a pile of manure from such good material. I carry the manure to where I keep it in an enormous pile, and allow it to remain till the fall or the following spring. The difference between the sawdust I use and pine sawdust is that my sawdust rots in the soil, whereas pine sawdust simply mixes with the soil, perhaps loosening it, but not manuring it so well, as it decays more slowly. There is another great difference. All the sawdust from the sawmill is wet, both from the logs being soaked in the water, and from the sap; but the sawdust that I use is dry, on account of its having been seasoned, and there is nothing left in it but fibre, and when it is used for bedding it is mixed with urine, which decomposes it more rapidly than water.

MANAGEMENT OF CATTLE—FEEDING.

This year I had, altogether, two hundred animals. I used to give some of them straw, and let them pick the best out, and then I threw the rest behind them, and let it mix with the sawdust. It first made a more complete bed, and by mixing with the sawdust made a better manure. To the cattle which I am not fattening I feed straw once a day and hay twice a day. I do not cut the straw beyond what is done by the threshing machine; I think the straw is better uncut, so that the cattle can easily pick the good out.

CATTLE FOR THE OLD COUNTRY.

The cattle required for the old country market should be four years old; and that is where the interest of the purchaser and the raiser is different. If you raise cattle from calves, the sooner you can fatten them the better; but I would rather buy them at three years old and sell them at four years old than buy at two and sell at three, because they fatten better when they are well grown, and you get more meat from an animal. Ordinary cattle lay on fat quicker in the fourth year than in the third. The difficulty is to get them fat enough for the dealers in the old country; a local butcher does not care so much, and he won't give so good a price. If a man raises cattle for market, I think it would pay him best to sell them at three years old. With me, a little provender is subsidiary to the attention I pay to my cattle; there is not an animal that I raise on my farm that I do not feed with grain. Decidedly none but thoroughbred males should be used for the breeding of stock, especially when they can be got so cheaply as they can at present.

PRICE OF THOROUGHbred BULLS.

A thoroughbred bull is ready for use at the age of twelve or fifteen months. I could sell you four fit for breeding at from \$60 to \$100, and I could sell you a dozen not yet fit for breeding at from \$80 to \$40; I sold one of the best this year, when dropped, for \$25—that was on the very day it was calved. For stock purposes, these

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are quite as good as the bulls Mr. Clay spoke of as being worth \$300. When I sold those forty animals, I weeded out of my whole herd everything that was at all of a common nature, and all my animals are at present from imported stock, either from Kentucky or from England. With regard to small farmers going into the breeding of cattle for market, I think that, as they nearly all breed a few now, it would pay much better to breed something that is worth breeding and that would sell at a good price. I don't think it would pay ordinary farmers to breed thoroughbred stock, but I think they should breed good grade cattle. I have generally sold all my good bulls in the United States. I have sold them as low as \$100. The buyers come over to me and get them. They do not have to pay any duty upon them, as they are thoroughbred stock. I raise grain to some extent.

GREEN FODDER.

At one time I adopted the soiling system largely; but at present I have plenty of pasture, and I only adopt it partially. I should be decidedly in favour of a mixed system. The plan I follow is to keep the animals on the pasture, and I grow corn in the fields near the pasture, and we just throw it over the fence and let them eat it there; but I always feed the grain in the stable, so that there is no hauling of green stuff at all. As soon as the pastures begin to fail I begin feeding corn.

AIR AND EXERCISE NECESSARY.

To Mr. Dymond.—Having regard to the health of the animals, I consider the mixed system much the best for a herd. I think the constitution of an animal is reduced by keeping it in the stable constantly. The more you can keep breeding animals in a state approaching the state of nature, the better it is for them; give them plenty of air and exercise, and, as soon as the nights become cold, stable them. I approve of their being kept in buildings made as warm as is consistent with good ventilation.

STALL FEED.—OIL CAKE.

I do not give any Indian corn to the breeding animals, I only give oats and bran. I use Indian corn in fattening, if I have nothing better. I could use cotton cake, or pea meal, or oat meal. I cannot tell anything about cotton cake, because I tried to buy some, and I found that I could not get any, unless I bought to the extent of about three hundred dollars, and I did not want that much. It has to be bought by the carload in the United States. I believe it does not cost more than one cent per pound, the same as oats; but it is only fed in limited quantities, and I did not think I could get rid of three hundred dollars worth, and I could not get a neighbour to join with me in buying it. Its desirable qualities are owing to its oily nature. I merely wanted to use it because it was cheaper than oil cake. I use flax seed by grinding it up and giving the cattle a pound or so, and I prefer doing that to using the cake. I used to feed a pound and a half of flax seed to every animal, and I bought it in the neighbourhood where it was raised at about two cents a pound. It is about the same price in England as here, but with me it was cheaper, because the flax seed was grown in the neighbourhood. At present it is three cents a pound, and therefore, I think three pounds of corn or grain is better than one pound of flax seed. Still, I always keep it to feed it to the calves.

PASTURE.—FERTILIZERS.—ASHES.—ROOTS.

Since I began to grow green crops most of the farmers in the neighbourhood have sown a little green corn. The river bank I keep for pasture on account of the convenience of the water. I have never yet used any special fertilizers, such as superphosphates or salt, but I think of trying some Brockville superphosphate to

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see how it will act. I have used large quantities of ashes and plaster every year on young clover. I put on about two hundred pounds to the acre. The ashes are usually unleached. I get a good deal of ashes from the sawmill. They are only from twelve to sixteen cents a bushel. I have grown some mangolds. I have never been very successful with turnips, because we are bothered with the flies; but I have grown good mangolds. As I have never made the growing of roots a specialty I could not tell the effect of the compost manure upon them; but for top dressing meadows it is exceedingly beneficial, and my land is getting rich under it. Part of this farm was worn out when I got it; it is really composed of seven farms which, when I got them, were in various degrees of condition. I have six hundred and fifty acres in one block, and the rest is outlying. The effect of my system has been largely to recuperate these farms. One farm, when I got it, was full of couch grass, and I ploughed it up and manured it well, and grew buckwheat twice, and then peas, and then Indian corn. I ploughed them all in except the Indian corn, which I took off green. I manured it well before I planted it, and sowed it by hand in the furrows about two feet apart.

COUCH GRASS.—OX-EYE DAISY.

To Mr. Malcolm.—Before the corn came up I harrowed it over, and as soon as it came up sufficiently high, I cultivated it between the rows. When I plough up the couch grass I plough it very shallow, and then run the hay rake over it and put it in a pile. I then plough it again and run a large toothed cultivator through it. That discourages it, and I sow buckwheat on it and plough it down, and if I have time I give it another crop of buckwheat or peas. When I get it so low that I cannot see the couch grass I sow Indian corn. In course of time the couch grass is subdued. It makes pretty good fodder for cattle. For two or three seasons after seeding down the couch grass may get in again. When I put the couch grass in a pile I cover it up and it rots, and afterwards makes very fine soil. The ox-eye daisy, however, beats me entirely. It both seeds and grows from the root. It is said that after three years it dies, but somehow or other the seed escapes. I am not an authority with regard to it. On my farm they were careless about the seed they got, and they found the oxeye daisy in some timothy, and I have not been able to get it out. It comes in chiefly in the timothy seed which we get from the United States. The same plant is common in England. The root is a knot of fibres, and the plants grow about eighteen inches or two feet high. The flower has a bright yellow centre, with little spears coming out of it, and is about the size of a half dollar piece. It is a marguerite. I suffer to some extent from the wild mustard, but we get rid of it by seeding down, and it does not come again until the land is broken up. I never have much trouble with the thistles. I don't know the rag weed; with me the oxeye daisy, couch grass, and thistles are the principal weeds.

CROSSING BREEDS.—AYRSHIRES.—DEVONS.—JERSEYS.

To Mr. Dymond.—I do not see what object could be gained by crossing an Ayrshire cow with a Shorthorn bull, because you would destroy two valuable breeds. Each animal is valuable, because it is thoroughbred, but if you mix them the progeny is not marketable at all. I have in some cases got very valuable animals in that way, but I think I have got equally valuable animals by crossing with the common natives. It is difficult to say what an Ayrshire animal is, because it has not very long been a pedigreed animal. Ayrshires were bought in Scotland because they took prizes at Ayrshire shows as milking animals; but some of our native cows are very good milkers. I have never kept any Devons; they are too small to suit the English market. Even for beef I would prefer an animal weighing 1,300 or 1,400 pounds to an animal weighing 1,700 or 1,800; but you have to breed what will sell, and there is nothing that will meet the demand of shippers so well as large animals. I have heard that the Devons are very good milkers, but I do not know that they are superior in that respect to the Shorthorns. I have never kept any Devons; I have only admired them when going through England

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and seeing them congregated in herds. In the Shorthorn I think you combine almost every desirable quality. As an animal specially adapted for producing butter, they say, though I don't know, that the Jersey cow gives exceedingly rich milk. I know I have tasted a great deal of Jersey butter, and have allowed other people to compare it with butter we have made from Shorthorns, and they pronounced our Shorthorn butter to be as good as the Jersey butter. There are some strains that are not very good milkers, but generally the Durhams are very good milkers. When I speak of Jerseys I include Alderneys.

IN-BREEDING.—TUBERCULOSIS.

With reference to the effects of in-breeding on the constitution, there are some families that seem to be rather delicate, but what the cause is I don't know. I have noticed a tendency to tubercular disease in all large milkers. If you do not feed milch cows well their constitutions will break down. That applies to all heavy milkers as well as the Shorthorns.

ADVERTISED CATTLE FEED.

To Mr. Malcolm.—I have had no experience with any advertised cattle feeds. I have used some occasionally as a stimulant. I have used Yorkshire Cattle Feed and Cattle Spice. I do not want any stimulants of that kind to have more than a temporary effect, because I consider it injurious for a cow to get used to such kind of food.

DAIRYING.—BUTTER MAKING.

To Mr. Dymond.—There is a good deal of dairying in our district. I have supplied milk to the factories in order to encourage them. I kept some cows for that purpose, but I found that some of my co-partners were in the habit of putting ice in their milk in order to keep it. I gave the milk to a cheese factory, not to a creamery. I tried to get a creamery established but did not succeed; most of the butter made in our district is made by hand. The farmers carted their milk to the cheese factory once a day, and when I found out that they were putting ice in their milk I withdrew my supply, and since then the cheese factory has closed up. We have neither a butter nor a cheese factory there now, although it is a dairying district. I make a good deal of butter, however. I used to let the calves suck the cows, but when the Shorthorn interest got rather depressed, and there was no possibility of selling these animals, (for high prices) I thought I would have a dairy of thoroughbred cows, and I began to feed the calves by hand. I skimmed the milk early so as not to exhaust it too much, and I added a little flax seed and oat meal to it. I find that the cows breed more surely when the calves are raised by hand. A cow does not seem to breed so surely when she suckles her calf. I have had very little trouble in the way of abortion. I raise all my thoroughbred calves except the bulls, which I try to sell. The butter that is made on my own farm is made by hand. We send it to Montreal. It is a very good butter. It is sold for family consumption in Montreal. We sell it in rolls as our brand, and get twenty-five cents a pound for it; but when the weather becomes too hot we put it in tubs and then sink the distinctive brand. The price depends a good deal on the price of tub butter generally; last year I think we averaged as much as twenty cents, and during last winter we averaged twenty-five cents.

TIME OF CALVING.

To Mr. Malcolm.—We have Shorthorn calves dropped at all seasons of the year. But when the cheese factory was running I wanted to get the cream fresh for the factory when it began, and it was, therefore, desirable to have them dropped in April or May. The factory opened on the first of May. If I were raising cows for dairy purposes I would just as soon have the calves dropped in the fall as at any other time, because my stable is warm, and I could feed them during the winter on milk, flax seed and oatmeal,

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and by the time the grass came round they would be able to go out to pasture. But with the accommodation provided by farmers in general, the fall or winter would be too cold a time to have the calves dropped, and they have them dropped usually in the spring. A common cow may be put to the bull at eighteen months old. It would then bring in its calf at two years and three months. The object I would have in bringing them in so early would be to save time and give them a habit of milking. If a Shorthorn cow is getting very fat, we put it to the bull at a little earlier age; if it is weakly and not thriving well we let it run a little longer. To be successful in raising a herd of Shorthorns, you must not be bound by any particular rule, but act according to circumstances. I have tried a good many experiments with the view to raising calves cheaply.

TREATMENT OF CALVES.

When a calf is dropped we let it stay three or four days with the cow, and milk the cow all we can, in order to keep its bag in a good state. This prevents inflammation in the bag. As soon as the cow's udder gets into a safe condition, I separate the calf from the cow, put it into a place by itself and accustom it to be halter-tied a little every day. I give it as much milk from the cow as it will take three times a day. If it is a good strong calf, I begin quite early, perhaps in the second week, to mix a little flax seed with the milk, perhaps a teaspoonful of boiling flax seed. We feed it for about a month on new milk, and then we begin to feed it on skim milk with flax seed, and at the end of ten weeks or three months we do not give it anything but skim milk and flax seed. I generally find that the calves do very well on that fare. I have a little field with a nice shed in it, and supplied with water, and when they become big calves I feed them with milk twice a day and let them have all they want of ground oats mixed with a little bran. I think bran is a good feed to produce milk. I always feed my thoroughbreds with a mixture of, perhaps, two-thirds oats and one-third bran; but I never give them any corn meal. Bran has a good deal of phosphate in it, and keeps the calf in good condition.

SHEEP FARMING.

To Mr. Dymond.—I have a number of sheep. I began with a flock of thoroughbred Cotswolds, because at that time it seemed to be the fashionable breed. I increased the flock by buying the best common sheep I could get throughout the country, and letting them be served by my thoroughbred Cotswold rams. Lately, Mr. Cochrane has gone into Shropshires, and Mr. Morgan and other shippers are inclined to think that black-faced sheep sell best, and I am disposed to have some of my sheep crossed with Oxford or Hampshire Down rams.

AMERICAN MARKET FOR SHEEP.

I have not bred for the English market, because the demand has just begun. I always sold my sheep to the Americans, obtaining five or six dollars apiece for fat wethers. I have a good flock of sheep, for common sheep, because year by year I have culled out all that were not doing well. I have now, at least, three hundred and fifty sheep. A few sheep have died in lambing, but I have never had any disease among them except that, towards the spring, some of the lambs have been a little delicate. There is a good deal of wool on the Cotswold, but I have some doubt as to its hardiness.

THE OXFORD AND HAMPSHIRE DOWNS—SOUTHDOWNS.

If I began again, I would begin, I think, on the Oxford Down or the Hampshire Down, I don't know which. The Oxford Down is larger than the Southdown. I don't know enough about the Oxford Down to give an opinion upon it; but it is said to be a fine large sheep with a good bulk of wool, but whether it will keep its character

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up or not I don't know. I know, from what the dealers tell me, that on the English market a Southdown wether will bring a higher price than any other sheep, because it is considered to be the best mutton; but I doubt whether shippers would give the Southdown the preference, owing to its smallness and to the fact that all animals are carried at so much a head. I have eaten the Cotswold mutton and found it very good, though there is nothing like the Southdown mutton, and the only reason why I should breed from Oxfords would be to get size. I dare say a cross of the Leicester with the Shropshire Down would do very well. I think these black-faced sheep generally have a good deal of power, and if I could get a black face on a Leicester sheep, I should be very well satisfied.

SHEEP RAISING PROFITABLE.

I think sheep raising is a profitable branch of industry. But for the sheep much stuff might go to waste, and they are very useful in the wilder parts of the land in preventing noxious grasses from growing up. They nibble at grasses that cows won't touch; and in winter they cost very little to feed, as you can feed them almost entirely on straw and hay. You can keep a hundred or two sheep, and not feel it. They eat up the ofal, and if you feed them on turnips, as the English farmers do, it is a grand way to improve the land; but the nature of the climate here is against feeding turnips to them as they do in the old country. I would sell them as lambs if I could get good prices for them, but the wether can be kept till the following year.

MANAGEMENT OF THE FLOCK.

I would not keep more than fifty ewes in a flock with one ram. If the ram was young, I would not go above twenty-five. I always keep the sheep and the rams separate, and I have them in five flocks, as the farm is large. I think, by keeping the sheep in small flocks of not more than forty or fifty, you are more likely to preserve them from disease. The annual increase in each flock of ewes is about one to each ewe. I keep account of anything I feed; but sheep eat so much refuse that it would be difficult to keep an account of them. I am obliged to look at aggregate results. I have experimented in fattening sheep, and I have found that you would scarcely get a profit on the meal they would consume—but then comes up the old question of manure. The sheep that are fattened for market you have to feed much better than others, if you are to sell them. You have to take into account the continual accrual of values; a series of operations may take place, all tending to the accrual of value; but neither of which, taken in itself, shows a profit. Few of the farmers around me are in the habit of taking stock. Most of the farms in my neighbourhood have been mortgaged, but I think they are dropping into the hands of those who have saved enough money to purchase them. The farmers have not improved much in the way of enterprise, but I think there is on the whole a perceptible improvement in the methods of farming, as compared with twenty years ago. But there is no improvement in the stock, except in the village cows which run loose. In the village, where a man keeps only one cow, he wants it good, and in the village there are some very good cows, some of which are claimed to be Shorthorns—and I can quite understand how they came to be Shorthorns.

WINTER TREATMENT OF SHEEP.

I never enclose my sheep in winter. My yards are very comfortable, and there are sheds accessible to them where they can run in and out at liberty, and I think they keep better in that way than any other. So long as they are protected from the winds and storms, they are better in the open air than shut up. They have been out sometimes when the thermometer is as low as from twenty to thirty-five degrees below zero; but that is generally upon bright days when the sun is shining warm, and the

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sheep like to be in the open air. I feed them hay in racks, into which they can put their heads. If we are feeding them on straw, we throw it to them in the yard, and what they waste is used for bedding. I have never had more than fifty or sixty in one yard; my buildings are numerous, owing to there having been a number of farms on my place. The open sheds for the sheep are built beside the barns. The thoroughbred lambs are never put to the rams before they are one year old. The finest of the early common lambs may go to the buck in the fall; this seems to save a year, and I do not think they are very much the worse for it. I usually pick out the worst of the ewe lambs and sell them; I only keep the best for breeding purposes. I would rather not use ram lambs for breeding. I breed the second year. I have no particular time for selling my lambs; I always sell them whenever I can get a good price for them. I have done something in Berkshire pigs, but at present I have only a few common ones. At one time I had quite a number of Berkshire pigs, but it was a great deal of trouble to attend to them, and I gave them up.

To Mr. Malcolm.—I have not had much experience in draining lands. My farm is pretty well drained naturally. Still, I have put a few tiles here and there in the lowest places.

W. T. BENSON.

MR. MATHESON'S EVIDENCE.

C. A. MATHESON, of Perth, County of Lanark, was called and examined

BREEDING—FEEDING—GRAZING.

To Mr. Byrne.—I am President of the South Lanark Agricultural Society. I am a pretty large breeder of stock. I generally keep from sixty to seventy head of cattle. I turn out about fifteen every year. Last year I was reducing my stock, and sold twenty-seven. My farm consists of 175 acres of land near the town of Perth, ninety of which is in bush and permanent pasture. I also own about 500 acres, which is at a distance, and simply used for grazing young cattle in summer. I raise all my own cattle. This year I raised sixteen calves, nearly all grades. I have only three full blooded stock. It is five years since I commenced to keep cattle for breeding. I bought a number of good cows and an Ayrshire bull, and raised calves from them; but at the end of two years I sold the Ayrshire bull, and got a Durham bull. I still continue to use a Durham bull. When I commenced raising cattle, I did some stall feeding. At first I bought a number of steers, two and three years old, and in the second year I again fed some more. But I found that the profit depended upon the kind of animal fed, and as I could not buy the right kind of cattle, I commenced to raise them myself. My object was to get an animal that would be a good stall feeder, and a good animal for dairy purposes.

SYSTEM OF FEEDING.

I feed straw nearly altogether. I cut it in a straw cutter. I generally start in the fall of the year with the fall wheat straw. It is all cut up in a loft over the cattle sheds, and every day as required it is dropped into a couple of boxes through holes in the floor; it is then wetted, and allowed to stand for about twelve hours. If necessary I add a little grain to it. By this means I feed all my straw; I suppose I don't waste five hundredweight during the season.

SAWDUST FOR BEDDING—CALVES.

My cattle and horses are all bedded with sawdust. In the early part of the winter I generally keep two calves in one pen, and after they get a little bigger, I tie them up. I feed all my cattle alike, except the calves, to which I give a little more grain and a little more roots.

[*Mr. Matheson.*]

WINTER FEEDING.

To Mr. McMillan.—I give them one feed of roots a day, along with the straw feed—generally about a pailful once a day. In the early part of the winter if I were feeding fall wheat straw, I would give about half a bushel of meal twice a day between twenty-one head. The rule I follow is to give them their feed in the early part of the winter about five times a day. I always feed my poorest feed in the first part of the winter, and make it a little better as the winter goes on. If the straw is not good enough, I add some hay or perhaps a little Hungarian grass or meal.

To Mr. Malcolm.—I don't feed any bran except to the cows after they come in, in order to keep up a good flow of milk. I don't think the bran increases the quality of the milk, but it increases the quantity, and keeps up the flow.

THE AYRSHIRES REJECTED.

To Mr. Gibson.—The reason I used an Ayrshire bull was that I wanted to get a good grade animal for dairy purposes; but I found out that the animals produced were very small, and I thought the milk was deficient. I thought some of my good common cows were better for dairy purposes than the Ayrshires; but I wanted to get an animal that would be good for dairy purposes, and that could also be fattened for beef, if anything occurred to destroy the milk properties of the cow. The Shorthorn cross has turned out very well, and I am only sorry that I did not begin in the first place with the Shorthorn.

STOCK IN THE DISTRICT DETERIORATING.

To Mr. Wiser.—The reason the cattle in our district are not so good as they were a few years ago is that it was principally a dairy district—butter making—and the farmers raised all their own calves; but in the last eight or ten years a large number of cheese factories have been opened, and the farmers generally kill their calves. The consequence is that the stock is deteriorating. There are more imported bulls there to-day than there were some years ago, but they are not beginning to tell yet. It would be a great benefit for the country if the farmers would use good thoroughbred bulls instead of the native ones. Four years ago there were only four pure-bred bulls in our district; they were all Ayrshires, but they have all been replaced with Durhams.

PURE-BRED BULLS.

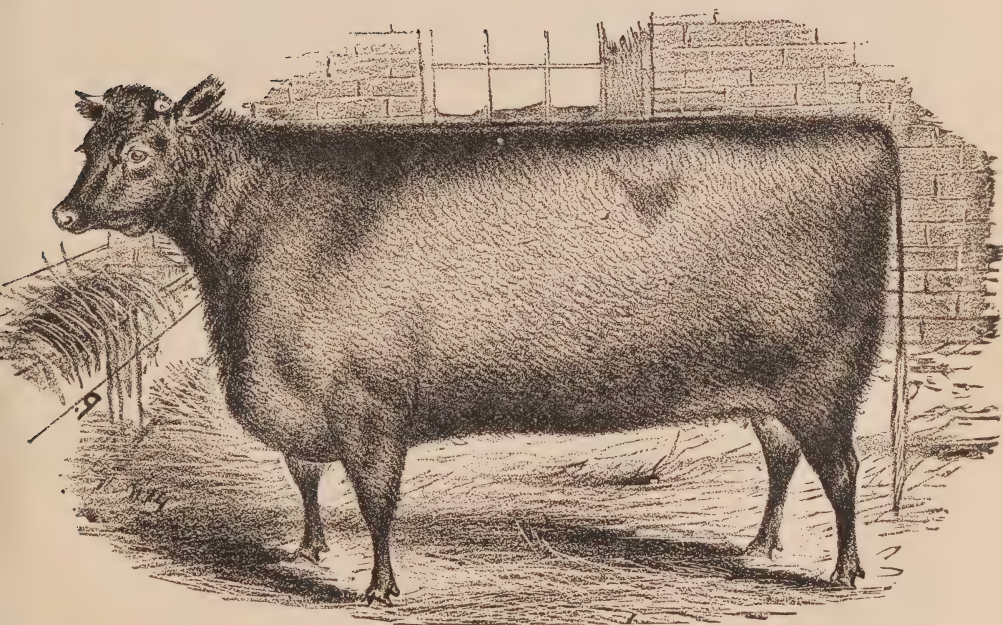
To Mr. Dymond.—Those four are all the pure-bred bulls I know of in the South Riding of Lanark, although there may be one or two others. The farmers have not gone generally into the use of pure Shorthorn bulls. I have not tried the Shorthorn bull on Ayrshire cows. The dairy interest has always been the leading interest in my section; but I think it is as well adapted for stock raising as for dairying. The people who are dairying are also beginning to keep more stock. It is still too much the case that they attempt to get all the milk they can, and kill off nearly all the calves. My bull has not yet been availed of much. The Township of Drummond Agricultural Society owns a bull, which is very largely availed of. For the membership fee of \$1 a year, the members have the privilege of using this bull, a couple of rams, and a couple of boars. The bull is not available for the whole township, because he cannot serve all. The farmers have no prejudice against thoroughbred stock, if they can get it for nothing; they are anxious enough to improve their stock, but they don't want to pay for it. The cattle from which the cheese factories are supplied are generally good common native milkers.

RAISING CATTLE FOR DAIRY AND MARKET.

To Mr. Wilson.—At present I do not buy any stock. I purpose to continue the dairying and the beef business together. I intend to cross the native heifers, as I bring
[*Mr. Matheson.*]



AYRSHIRE BULL.



SHORTHORN HEIFER.

them up, with a Shorthorn bull, to give them size and make them better for beef purposes. My heifers are not thoroughbred, but the bulls bred from are.

A CREAMERY COMPANY.

To Mr. Byrne.—I was connected with a creamery company last year as its secretary. The creamery was originally a cheese factory about four miles from Perth. The gentleman who owned the cheese factory manufactured the milk into butter for the patrons. We delivered the milk at the factory, paid him so much a pound for manufacturing it into butter, and he delivered it to us in packages ready for shipment. The article he turned out was very good, although it was not so good at first as afterwards. Our original agreement was to pay him four cents a pound for the butter he manufactured, we delivering the milk at the factory and taking the butter and skim milk away. The affair was managed by a committee composed of one of the patrons, the man who worked the factory and myself.

DEPRESSION IN THE BUTTER TRADE—PRICES.

Last year in the early part of the season, the butter trade was very dull. We started the factory on the 15th of May and closed on the 11th of October. We were offered seventeen cents a pound at the factory for the first butter we turned out, but we thought we ought to be able to do better, and we sent it to Montreal, where the best offer we could get for it was fifteen cents. Just then butter was falling; the morning we were offered seventeen cents for it at the factory it was quoted at eighteen cents in Montreal. We sent it down to Mr. Ayer in Montreal, who handles most of the creamery butter, and he told us it could not be beaten. We concluded to ship it to the old country, where we only realized about fourteen cents for it. The next lot we shipped to another house in the old country, and it did not bring quite so much. The third lot we sold to Mr. Ayer, who gave us fifteen cents for it, delivered at the Rideau. When we were getting fifteen cents, good farmers' dairy butter was selling at ten cents. We sold all our butter to Mr. Ayer just as it was ready until July; but when we came to August we made up our minds to run a little risk, and hold it a little longer. After some negotiation, we sold, in the beginning of September, what we had in August at nineteen cents, and what we made in September, and during the rest of the season, we sold ahead for twenty cents. If we had held it a little longer I suppose we could have got twenty-eight cents for the same butter. The other day we had an inquiry from the firm we shipped to a year ago, and the quotation they gave would have netted us twenty-two cents a pound here. In my opinion, beyond doubt, there is nothing like the creamery system.

FACTORY STATISTICS

To Mr. Dymond.—We never kept any account of the number of cows whose milk went to the factory. From the 15th of May to the 11th of October, while the factory was open, 514,830 pounds of milk was sent to the factory, which produced 18,197 pounds of butter, and netted \$2,247.23. We estimated that it took $28\frac{1}{4}$ pounds of milk to make one pound of butter. We netted a fraction over $12\frac{1}{2}$ cents per pound. In the early part of the season we were supposed to be doing very well according to the prospects, and we got milk from the patrons; but late in the season, in the month of October, when some got dissatisfied, and butter went up, I don't think we got the full share of milk; so that I think twenty-five pounds of milk to the pound of butter would be a fair average for the whole season, if the factory was properly managed.

DECIDED ADVANTAGE OF CREAMERY BUTTER.

Taking the whole year together, the creamery butter had a decided advantage as regarded the price; in quality, the creamery butter is of a uniform quality all through. It was made pretty fresh for the English market. Mr. Steadman took three packages to

[*Mr. Matheson.*]

the Dominion Exhibition, at Ottawa, last year. He got the second prize for creamery butter; but he sold it to a private person in Ottawa for twenty-five cents a pound, who preferred it to any other exhibited. I heard the statement of Mr. Gibson read; I agree that the majority of the butter shipped from Canada to England is very poor; but I think it is gradually improving. The buyers of butter are discriminating more closely as to quality than they did a few years ago, and there is more encouragement for people to turn out a good article. At our creamery we had all the milk sent, and not the cream merely. The creamery is not continued this year because it was in an inconvenient place; the drawing cost too much, and the quantity of milk delivered was too limited. The bulk of the milk came from a distance of four miles. I have no doubt that if a creamery were started at Perth, with a short draw of about three miles, they would get the milk of a thousand cows; it would take the milk away from the cheese factory, because when a farmer takes his milk to the creamery, he can get the skim milk back again to feed to his calves and pigs. I think butter at twenty-two cents a pound would pay the farmer better than cheese. In my first year I sold my milk and raised my calves on pea meal; the second year I made my own butter; the third year I sold my milk again; and the fourth year I went into the creamery business.

FACTORY BUTTER-MAKING ECONOMICAL.

For the ordinary farmer, I think the creamery would be better than dairying at home, in the long run. I think three cents a pound would be a fair charge for making the butter, and, in any market, factory-made butter will bring three cents a pound more than the best private-made butter. I think it will cost any farmer who makes butter at home, at least, one cent and a half per pound for packages, cloth and salt, and that, I think, would pay for drawing and delivering the milk at the factory.

PROPORTION OF MILK TO BUTTER.

There were a number of farmers who did not send their milk during the month of October, and in making up our accounts, we made them up to the 1st of October, and also for the month of October by itself; and we estimated that it took $28\frac{1}{2}$ pounds of milk, from the 15th of May, when the factory was started, to the end of September, to make one pound of butter. That netted us $12\frac{1}{2}$ cents, or equal to $4\frac{1}{4}$ cents for ten pounds of milk. In October twenty-two pounds of milk made one pound of butter, that netted us sixteen cents, or equal to $7\frac{1}{4}$ cents for ten pounds of milk. At the beginning of the year the man who made the butter did not take all the butter out of the milk that he should have taken, and he returned us what was equal to \$129, or about three quarters of a cent on the pound of butter, so that three and one quarter cents was what we really paid him for the making.

To Mr. McMillan.—I think the raising of cattle for beef purposes could be combined with producing milk to send to the factory for butter purposes. I think there will be a market for all the creamery butter we can send to England for some time to come.

SOIL OF FARM—CROPS.

To Mr Dryden—The soil on my farm is heavy clay, sandy, and also some muck. I have one hundred and twenty-five acres in one place, and fifty acres about a mile and a half away. There are no buildings on the fifty acres except a barn. The only grain I grow is fall wheat, except occasionally a field of coarse grain, such as peas and oats. I do not grow barley. All the farmers in that section grow spring wheat, but I do not. The varieties of fall wheat grown are Clawson, Scott, Diehl and Silver Chaff. I think the Clawson and the Scott are the best; they are harder, and stand the winter better than the others. The Silver Chaff is almost as hardy as the Clawson, and I don't know but it is a better wheat.

[*Mr. Matheson.*]

SUMMER FALLOW—MANURE—SALT.

I generally prepare the soil by a summer fallow. I have heard of clover sod being turned over, and I believe it has been very successful with those who have tried it, I have had no personal experience with it. The only manure I have used is barn-yard manure. There is a little salt being used this year; I never used any myself. I know two farmers who have brought in a car load between them this spring. One of them tried it last year, and was satisfied with it.

PEA CROP—THE BUG—SPRING WHEAT.

To Mr. Dymond.—There are a good many peas grown in our section, and the crop is generally successful. The bug has not arrived there yet. Last year the spring wheat was a complete failure, and I believe there is a grub attacking it this year. Last year and the year before I had forty bushels of fall wheat to the acre; this year it is not nearly so good. I, probably, only grow from six to ten acres of wheat altogether. My land is principally occupied with hay; I grow, also, some roots, corn and Hungarian. I have cultivated with the view of raising stock. At one time I grew a good deal of grain, but I concluded that there was more to be made by stock raising, and I think that is the feeling among the farmers of my district, generally.

IMPROVIDENT FARMING.

My farm is rather better than the average. A great many of the farms are run down. The great reason of it is, I believe, that the farmers sell all they have, and do not keep anything for the improvement of the soil. Some who do that are pretty well off, too. The farm buildings in my district are generally poor, but they are beginning to improve, and there is a disposition to take more care of stock.

MANAGEMENT OF MANURE.

To Mr. Byrne.—I keep most of my manure in a pit under cover, and I preserve most of the liquid manure in the same way. I have a "lean-to" attached to the cattle-shed, and the pit for the reception of the manure is under it. The cattle stand and feed together, with a gutter behind them which gathers most of the liquid, which is all pure manure, and it is carried into the pit. I put up a shed 90 feet long by 30 feet wide, and in that I have two rows of cattle which face outwards. In front of them, at each side of the shed there is a water-tight trough and a passage, and they stand some distance apart on the platform, which is about five feet six inches wide. They are all tied with chains, and behind each row of cattle there is a gutter about twenty inches wide and eight inches deep, and between the two rows of cattle there is a passage four feet wide, on which the manure is wheeled out. At the side of this building I have a "lean-to" which runs half its length, is fourteen feet wide, and is sunk two feet in the ground. It is water-tight, so far as we can make it. Three sides of this pit are boarded tightly with hemlock plank, and on the fourth side there is a passage eight or ten feet wide for a cart or waggon. I do not use any straw for bedding; sawdust is the cheapest thing I can get for that purpose, and it soaks everything up, increases the bulk of the manure, and makes its quality very fine. One load of this manure is equal to two or three loads of what I formerly turned out. The gain which I have derived from preserving the manure for the land has been very large. The roots I grow are turnips, mangolds, carrots, and sugar beets; I have had 500 bushels of roots to the acre.

NOXIOUS WEEDS.

To Mr. Malcolm.—The prevailing noxious weeds in my district are thistles, couch grass, mustard and daisy. The couch grass, I think, is the worst we have; the best
[*Mr Matheson.*]

remedy for it is summer fallow, and the same may be said of the mustard. I generally have a summer fallow, and plough under the weeds as soon as the spring work is over, and after two or three ploughings, I cover the surface with manure.

AVERAGE YIELD OF WHEAT.

To Mr. Byrne.—The average growth of spring wheat in the County of Lanark to-day is no more than twelve bushels to the acre; when I cultivated it, that is what I got, and I thought it time to stop; last year I don't think it averaged five bushels to the acre. I think that part of the country is well adapted for dairying and stock raising; all that is wanted is a little more energy among the farmers.

THE DAIRYING INDUSTRY.

Dairying has been the principal industry there for a number of years past. Within an area of eight or ten miles of the Town of Perth, there are nine or ten cheese factories. The farmers might support more if they tried; they could also increase the quantity sent to each factory. I think there is an increased disposition among the farmers of that section to house their stock comfortably.

SALT—IMPROVEMENT OF STOCK.

To Mr. McMillan.—The salt we used in our creamery was English salt, "Higgins' Eureka." I am not acquainted very much with the sheep farming in my section. There has not been much improved stock brought in recently, except by the Drummond Agricultural Society.

THE DRUMMOND ASSOCIATION.

To Mr. Dymond.—The Drummond Society has from fifty to sixty members, three-fourths of whom are farmers. They have, perhaps, 400 cows altogether among them. Each member is allowed to have only one or two cows served by the bull.

FARM ACCOUNTS—BEE-KEEPING—FARM LABOUR.

Our farmers do not, as a general rule, keep accounts, nor do they take stock, unless to a very limited extent. There is nothing being done in my section in the way of tree-planting with the view of replacing the forests. Bee-keeping is not followed to any great extent; there may be two or three farms with a number of hives, but there are none devoted exclusively to bee farming. I believe farmers could hire more hands than they do, with advantage. I myself keep two men all the year round, and I hire an additional man for the haying season. There is plenty of labour in the district, if it is required.

TURNIP GROWING.

To Mr. Dryden.—I sow my turnips on level ground about fifteen inches apart. I prepare the ground for turnips just the same as for the green crop, and use a machine sower. When my root crop comes up, I thin the weeds out with a hoe in the ordinary way. I do a little soiling; I always grow corn for that purpose.

AID TO SOCIETIES.

I think that no Agricultural Society receiving Government money should be allowed to offer prizes for bulls, unless pure bred. If the amounts received by the Electoral District Agricultural Societies from Government could be increased say fifty per cent., I think a very large amount of good might be accomplished, as the grants at present received barely enable these societies to exist, and in many sections, they are the chief, and in some sections the only, means of educating the great mass of the farmers in improved farming, and the benefits to be derived from raising good stock, grain, etc.

C. A. MATHESON.

[*Mr. Matheson.*]

Sittings to take oral evidence held at Chatham, Thursday, July 22nd, 1880.—*President*—MESSRS. SAUNDERS (Chairman), and DYMOND

MR. STEPHEN WHITE'S EVIDENCE.

STEPHEN WHITE, of Charing Cross (Reeve of Raleigh), was called and examined

FULTZ OR BLUE STEM WHEAT.

To the Chairman.—I grew the Scott wheat for a number of years, and lately the Clawson, but we are now introducing the Fultz or Blue Stem, which seems to be better than either. It is four or five days earlier than the other varieties; it is free from rust; it stands the winter equally as well as the others, and is as prolific. These are the most of the varieties of fall wheat which are grown here.

SPRING WHEAT A FAILURE.

Of spring wheat the Fyfe has almost gone out of existence; in fact spring wheat is very little grown, as it has proved a failure altogether. It grows well and looks well until about two weeks or ten days before harvest, and then it seems to shrink up from the hot rays of the sun, and in some cases the blade would turn yellow. I believe it is now acting in the same way in the neighbourhood of Guelph. I don't think its failure is caused by rust. The hot sun seems to ripen it too quickly

FALL WHEAT CULTIVATION—SALT—THE WIRE WORM.

We have had no failure of the fall wheat crop for several years. We have not used salt extensively, though it has been tried on a small scale. One field near me was tried last fall, in a locality where the wire worm was particularly bad. The land had been under clover for some years. This field will average about forty bushels to the acre. The salt has also the effect of making it ripen a few days sooner, and of keeping it free from rust. I think it is desirable that salt should be used more largely than it is at present.

GOOD CROPS—WEEVIL—RUST.

Our fall wheat crop was never better in this country than it has been for the last three years. A number of years ago we had the weevil, which damaged our wheat seriously, and after that the rust, but for the last three or four seasons we have had none of these troubles, and the sample has been very good.

INCREASED AREA OF WHEAT.

The breadth of fall wheat sown has increased very much. I think the only effect of the removal of the forest was in taking away the shelter which kept the snow on the wheat, and prevented the blasts from driving over the fields in full force. If the wheat here gets through the winter we have no trouble with it. Some of the most beautiful fields of wheat I ever saw were sheltered by dense forest, and it matured well.

CLOVER SOD FOR A SEED-BED.

Clover sod, turned over, has lately been used to some extent as a seed-bed for fall wheat, and it has done very well. I turned over fourteen acres last year, and as it was very dry, I was a little afraid of it, but it turned out a fine field of wheat. It was just ploughed over once. In this part of the country there is very little summer fallowing. The fall wheat is chiefly grown on stubble land, or clover turned over.

[*Mr. White.*]

SUCCESSIVE CROPS OF WHEAT.

In some cases it is grown on wheat stubble for six and seven years in succession, and grown successfully. I know of one field where the present crop is the seventh crop of wheat, and the yield averages twenty bushels per acre for the last three years.

METHODS OF CULTIVATING.

The soil is a clay loam, well ploughed, and a slight dressing of manure is put on the top and harrowed, and the seed drilled in. Some here plough the stubbles over with a gang or single plough; lightly harrow it down; let it lie for a month; then turn it up again a little deeper; then harrow, and drill in the wheat; others make only one ploughing. I think it is an advantage to plough it over twice as that helps to destroy the weeds. Clay land is mostly ploughed in the fall for spring wheat, and the land is prepared for sowing as early in the spring as possible.

UNDER-DRAINING.

There is very little under-draining done in this county. There is some along the river, and it seems to have had a good effect upon the land.

FERTILIZERS.

I don't think any artificial fertilizers have been used for wheat, but plaster is used for clover.

COST OF GROWING FALL WHEAT.

Our land for fall wheat would cost for rent and taxes about \$5 per acre; preparing the land for crop, \$3.50; seed, \$2; sowing and harvest, \$2.50; threshing, \$2; marketing, \$1; or in all \$16 per acre.

BROADCAST SOWING, OR DRILLING.

Wheat is sown both broadcast and in drills, but, I think, mostly in drills. The average sown is $1\frac{1}{2}$ bushels per acre for drill sowing, and 2 bushels for broadcast sowing. Some think that $1\frac{1}{4}$ bushels per acre is enough for drill sowing. I think wheat sown in drills stands the winter a little better than wheat sown broadcast. Broadcast sowing is done chiefly by hand.

SETTLEMENT ON THE FARM.

To Mr. Dymond.—My farm is situated at Charing Cross, about seven miles from here, and is in a central position in the county. I have 200 acres, of which about 50 acres are in bush. My father settled on the farm fifty-three years ago and I have been there ever since.

KENT AS A WHEAT COUNTY.

I am well acquainted with the agricultural capacities of the county generally. I am not so well acquainted with Essex, though I know considerable about its land. I have been a member of the Council of the Agriculture and Arts Association of the Province of Ontario for twelve years, have been Reeve of the Township of Raleigh for twenty years, and I have also been Warden of the County. I regard Kent as a wheat growing county. The area of wheat culture has largely increased during the last few years, owing to the fact that it has grown well and paid better than other crops. There is very little poor wheat-growing land in this county except small portions of the plains in Dover and Tilbury. I think wheat is pretty evenly distributed over the whole county, and about one-half the cultivated land is now in wheat. Ten or twelve years ago the cultivated

[*Mr. White.*]

area of wheat was nothing like so large as it is at present. Wheat has been partly taking the place of other crops, such as corn and barley, especially the latter, as the price has been low.

EXTENSIVE DRAINAGE WORKS.

Twenty years ago the land was considerably covered with stumps, and there was a good deal of low land. The land has since been well drained both by private enterprise and municipal and Government draining. There has not been much under-draining in the county, and I have not heard of any one taking advantage of the Tile Drainage Act.

AVERAGE YIELD OF FALL WHEAT.

Spring wheat has nearly gone out of cultivation in the county. The average yield of fall wheat for the last three years, leaving out what was sown too late, or on black, mucky land, so that it was frozen, would be, for the last three years, about thirty bushels per acre. From what I have seen in travelling about, I think this is as good a wheat-growing county as any in the Province. I would not think that the average yield of fall wheat, over the other portions of Ontario, would be more than twenty bushels per acre.

IMPROVED METHODS AND RESULTS.

I think our average would be greater if our cultivation was better, and we did not sow so much land in stubble. I know of cases where proper methods of cultivation brought an average yield of 40 to 45 bushels per acre. Most of my fall wheat is just ploughed over once on stubble or clover sod. I think if wheat is sown on stubble, the land should be ploughed twice, and manured. We manure our land, and the manure is included in my estimate of the cost of preparing land for wheat. My estimate also includes the time and labour of the farmer and those who assist him.

GROWING FALL WHEAT PROFITABLE.

Fall wheat growing in Kent is a very profitable branch of the farmer's industry, and I think it can be made more profitable by proper farming. The departure of the weevil is not peculiar to Kent; I think it is pretty general. We have had no particular trouble with our fall wheat for the last few years. The Hessian fly has not troubled us. We have tried every variety of spring wheat that we could hear of, but none of them succeeded. We have not tried the White Russian spring wheat. We are gradually clearing away our natural forest protection.

DISCONTINUANCE OF BARLEY GROWING.

To the Chairman.—Barley has been grown to a considerable extent in the county, but the amount sown has fallen off wonderfully the last few years. The principal reason is that the price has been so low that wheat has paid better. We have had no particular failure so far as quantity is concerned, but the rain sometimes discolours the grain, so that it brings a lower price.

YIELD OF BARLEY—PREPARATIONS FOR CROP.

The average yield of barley is about 35 bushels an acre. The land for a barley crop is prepared in the fall and furrowed out ready for seeding, and the grain is sown as early as possible in the spring. A barley crop generally follows a wheat or corn crop. On loamy soils we plough the land for barley in the spring. We use no particular fertilizers except ploughing down clover, and barn-yard manure.

[*Mr. White.*]

COST OF BARLEY CROP.

The cost of preparing ground for barley would not be so much as for wheat. The interest or rental would be about \$5 per acre; preparing the land, \$3; seed, \$1; the other items would be about the same as for wheat, making in all \$14.50 as against \$16.

METHOD OF SOWING BARLEY.

Barley is sown both broadcast and in drills; the largest amount is now sown in drills. The average quantity of grain sown on the acre is 100 pounds. The question of whether drill or broadcast sowing is the best depends on the kind of land. If the land is clay I would not use the drill, as the soil is apt to bake after heavy rains, but for mellow land I would use the drill. Drilling does not require so much seed, but I think barley will grow as well broadcast as in drills. I don't think there is any difference in the yield.

AVERAGE PRICE—PROFIT.

To Mr. Dymond.—The average price of barley during the last year or two has been about \$1 per 100 pounds, which would leave only \$19 income per acre, as against nearly \$30 for wheat.

CHARACTER OF SOIL.

I think barley is just about as exhausting a crop as wheat. Our land has been in such good condition that it has not suffered from deterioration, but, of course, all the land in the county is not equally good. Clay bottom, with loam on the top, is the richest land we have, and I think that soil constitutes more than half the county. There is more clay in the West than in the East Riding. In the East it is more of a sandy loam, but fertile and rich, though not so stiff as the other kind of soil.

PREPARATION OF DRAINED LANDS FOR WHEAT.

The land which has been largely drained is a very black rich loam on the top, with a subsoil of clay. Such soil is good for Indian corn, oats, etc., but it is so rich that wheat grown upon it is apt to lie down. If the clay is ploughed up as well as possible, and the land cropped with Indian corn three or four years and then barley, it will grow wheat. I don't think it is best to crop long without manure even on the other kind of land. That land raises very fine crops of fall wheat—it grows well and is free from rust. I think thirty bushels per acre would be a fair average for the county.

THE LAKE SHORE DISTRICT.

Along the lake shore we have a great deal of gravel upon which we grow wheat, etc. The straw is not so long or plentiful, but taking one year with another it yields about as well as the other.

OAT CROPPING.

We grow oats considerably, and they do well both as to yield and quality. We have had little or no failures of the oat crop, when it has been put in in proper season. The black varieties such as the Tartarian are sown largely, but some sow the common white oats. As compared with the black, I think the white oats yield equally as good. Some sow wheat after oats, but I don't like it. The ground should be ploughed twice. A good many people seed down clover with oats, and it turns out well when the soil is in good condition; but I don't think oats do so well for that purpose as wheat or barley. I don't know of any oats being used locally for meal purposes. Some oats are exported; I think they are bought mostly at Toronto and London. Oats are sown both in drills

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and broadcast. Three bushels per acre are sown broadcast, and two in drills. The yield is as great when sown in drills as in broadcast, and it is the more economical method. The drilling is the only extra expense. When they are sown broadcast they are sown by hand. The tube drill is used. I think the cost of a crop of oats would be about the same as one of barley, namely, about \$14.50 per acre. Our yield is about 50 bushels per acre, and the market price 30 to 35 cents, taking one year with another. Oats grow very well in this region, though sometimes the crop is crushed down by heavy storms.

RYE—THE PEA BUG.

To the Chairman.—I don't know of any rye being grown in the country, and peas have gone out of cultivation because of the bug. A few are still sown, but I think the Legislature should prohibit their growth until the bug is killed out. They used to grow well in this country. I think the blue pea is as little liable to the bug as any. The only plan we had of avoiding the bug was to sow very late, and we sowed later and later every year, but now we cannot secure a crop even by that means.

To Mr. Dymond.—I think it is nearly twenty years since the pea bug made its appearance. Before that the pea crops were both large and profitable. We used to sow wheat after peas, and it was a crop that answered well for that purpose.

NO ACTION AGAINST THE PEA BUG.

I don't think any decisive steps were taken at first to prevent the ravages of the bug. Some are growing peas yet, and of course that is sufficient to keep the pest in existence. There has been no concurrent effort made to take action in the matter, the agricultural societies have done nothing in particular to get rid of the insect. There is no hope of getting rid of it, in my opinion, until the people are compelled to quit sowing peas. I don't know of any who are raising peas successfully. I think I have heard of its being got rid of in other counties by concurrent action in the manner suggested. Some continue to sow peas for the purpose of feeding them green.

To the Chairman.—I know of no section of the county where the growing of peas has ceased.

INDIAN CORN.

We grow a considerable quantity of corn in this county, though not so much as we used to. It is chiefly grown for the grain, and very little for green fodder. The crop is generally successful. The average yield of shelled corn throughout the county would be thirty-five to forty bushels per acre, though where the land is properly cultivated it will yield fifty bushels without much trouble. A great deal of it is planted on new land amongst stumps, etc. The price of corn is higher now than formerly. I don't think there is so much corn planted as there used to be, owing to the fact that wheat pays better. The Dent, Yellow Flint and White Flint varieties are grown, though our Dent is not quite the same as the United States corn. Most people grow the Dent. I know of no cases of failure of the corn crop when it has been planted in proper time. We export some corn, but it is generally grown for feeding purposes.

ROOT CULTURE.—PRICE OF CORN.

Scarcely any roots are grown in this part of the Province. I think the price of imported corn regulates the price of ours. It has been about 50 cents lately, and I think that would be a fair average from year to year, but it was lower for a few years on account of the large quantity coming in from the United States. The price went down to 35 and 40 cents.

[*Mr White.*]

ADVANTAGES OF RAISING CORN.

I think corn is a very good crop for the farmers to raise when the land is suitable. It does good to the land by necessitating its being cultivated and kept clean. Then for fodder purposes if it is cut before the frost, an acre of corn is worth almost as much as an acre of hay, for feeding cows and other cattle. Next to wheat corn is perhaps the most profitable crop grown in this county.

MODE OF PLANTING CORN.

When planted in hills, the hills should be about four feet apart, with three stalks to the hill. As to the cost of the crop, the interest or rental would be about \$2.50. The cost of the seed would be very small—about one bushel to six acres.

COST OF RAISING CORN.

A man can plant with a hand planter about four acres in a day, or with a horse planter, ten or fifteen acres. Sowing and harvesting would be about \$5; the total cost about \$15 an acre. A great deal of our corn is shipped to people in the east for feeding purposes. Buckwheat is not much grown here.

YIELD OF CORN—PROFIT IN THE FODDER.

To Mr. Dymond.—My calculation is that the cultivation we have been describing would give about 50 bushels to the acre, of shelled corn. About 40 cents per bushel is the price we get when it is brought in from the fields in the fall. If we keep it till spring we have to depend on the meal, whereas in the fall people want it for feeding. That would show a result of about \$20 an acre. The fodder is worth about \$2 per ton—it is better for milch cows than hay. We don't use it for cutting up to fatten stock. I put the fodder at about \$5 per acre.

ESSEX AND KENT CORN COUNTIES.

The counties of Kent and Essex, with portions of Lambton, are pre-eminently the corn growing districts of Canada. Corn is grown in Elgin and Norfolk, but not very extensively I believe.

A PAYING CROP.

The ordinary price at which corn has been sold in this county during the last few years has been 40 cents. At present it is selling at 50 cents and 60 cents, and of course we are participating in the advantage. I have heard of corn being bought for 30 cents, but of course that was not the regular market quotation of the day. I regard corn as a paying crop at 40 cents, because besides the price, it cleans and shades the land, and does it a great deal of good in that way. We grow a succession of crops of corn where the land is very rich. The preference for wheat has rather tended to diminish the growth of corn. A great deal of corn is used locally for the feeding of cattle, as our stock is all fed on corn and not on roots.

POTATOES.

To the Chairman.—Of early potatoes, I think the Early Rose is the favourite variety, though a number of people are growing the Snowflake. The crop is generally a good one, and we consider it profitable. We were troubled a few years ago with the Colorado beetle, but the last few years it has been less destructive than before. I attribute its lessened destructiveness to the fact that they are passing through the country, only re-

[*Mr. White.*]

maining in one place for a temporary period. Very little Paris green has been used upon the potatoes the last few years. I have observed no parasitical insects feeding on the bug, but I notice that hens and turkeys eat them in potato patches near houses or barns. I have grown good crops the last two years without using any efforts to check the bug. I never knew of any injury resulting to the crops by the use of Paris green.

EXPORT OF POTATOES.

To Mr. Dymond.—We export potatoes considerably from this county to the United States and some to the East—they are rather an important article of export with us. Sometimes they are grown on new land and sometimes on old.

PLANTING UNDER STRAW.

Some are planting them under straw, which they think is better than covering them altogether with dirt. I have not tried that plan, but I have seen it tried in Michigan. Some don't put any earth on at all—just put about a foot and a-half of straw upon them. Others, however, put on a small quantity of earth under the straw. The potatoes grow just whenever the cuttings have been put in.

To the Chairman.—I have not tried, or seen tried, the cultivation of potatoes on this plan.

GOOD PASTURAGE.

The reason we don't grow root crops, is that corn is used for feeding. We don't grow any other green plants for fodder to any extent. Our land makes excellent pasturage, and we have a large acreage of land in permanent pasturage—that is in localities which are too low for ordinary cultivation. It is low prairie or marshy land which is covered by water from Lake St. Clair in the spring, and when the water goes off the pasture is excellent. It is too wet for successful cultivation. Nearly every farm has a certain acreage of permanent pasturage, which has been seeded down and is partly cleared. It could be brought under cultivation at any time.

STANDING TIMBER AS SHADE TREES.

As a rule, farmers throughout the county leave standing scattered trees for purposes of shade. In some cases bushes have grown up along the fences, and have grown to the size of trees.

ROTATION OF CROPS.

I could not say that the systematic rotation of crops is becoming general. It is more of an irregular rotation, guided mainly by results from year to year. Farmers simply ask themselves, "What can I raise best on a particular field this year?"

To Mr. Dymond.—The reason why so little attention has been paid to the rotation of crops, is that our land is so rich people do not see the necessity of it. In future, no doubt, they will have to pay more attention to the subject. I think even at present they should begin to farm systematically.

To the Chairman.—My practice has been to seed down every three or four years, then break it up and put corn on the clover sod. Last year we tried wheat on sod, and that was successful. Then oats, barley and wheat three or four years; then seed down again.

RECUPERATION OF THE SOIL.

To Mr. Dymond.—My means of recuperating the soil has been seeding down, and the liberal use of barn-yard manure. There is no doubt that in other portions of Canada the soil was, at one time, as rich as ours, but it has become exhausted through neglecting its restoration. A large portion of our county requires attention now before the land has become too much exhausted.

[*Mr. White.*]

TREATMENT OF MANURE.

To the Chairman.—No special means are taken by farmers for the preservation of manure. We have large quantities of straw, and sometimes we have to buy cattle to tramp it down in the yard, so that we can utilize it as manure. In spring I generally draw it all out together in a large pile, and after harvest, in preparing the wheat land, I spread it on. There is very little manure put on now in a green state, except occasionally, on corn. I think it is much better to rot it, as rotting helps to kill the bad seeds, and makes better manure. I have heard of no means being taken to utilize liquid manures.

FEEDING BRAN—SWAMP MUCK.

Bran is purchased by farmers in considerable quantities, and fed with grain to horses and cattle through the winter. I know of no attempts having been made to utilize swamp muck, as a compost, with barn-yard manure. I have seen muck thrown out of a ditch used in that way, and I believe it is very valuable for that purpose.

SPECIAL FERTILIZERS.

We have used some plaster of paris, but very little phosphates, either mineral or bone. Lime is very little used; Goderich salt has been slightly used with us, but I think it will be more largely used in future. I have seen its effects tried by sowing it on a few ridges in a field, and upon those ridges the crop was two or three inches higher than on the others, and ripened earlier. About a bushel was used to the acre when it was sown in that way. Some farmers use ashes on their land; others sell the ashes, which, I think, is a great mistake. I think the use of barn-yard manure is the best means of improving thoroughly impoverished clay soils, but the ploughing in of clover is better on lighter lands. I have seen the crop doubled on one part of a field where barn-yard manure had been used judiciously. I never tried sub-soiling as a means of recuperation.

WASTE OF MANURES.

To Mr. Dymond.—Farmers are not in the habit of taking any special means for the protection of manure; part of it is generally exposed to the weather, and part is in the sheds where the stock is. I know of no instance in which liquid manure is specially saved; and I should say that its loss diminishes the value of the manure fully twenty per cent. I have not sown much salt myself, but I have seen the results of its application by others. The effects were very observable in better crops, a better sample, and longer straw. It has been tried on spring wheat as well as fall, but I am not aware that it had the same effect on spring wheat. I think salt costs us about \$6 per ton—Canadian refuse salt. I believe there is an unlimited supply of that kind of salt. If a number of farmers were to join together and get a vessel load, it would be a great advantage, as it is expensive by train.

OPEN DRAINS

Our drains are principally open drains, made under the Ontario Government and Municipal Acts, and by private enterprise. The farmers, generally, make open drains into the public drains. We have a few tile drains, but not very many. Tiles are manufactured in this part of Canada. I have no doubt as to the advantages to be derived from tile draining.

IMPROVEMENT OF STOCK.

To the Chairman.—Our cattle have been considerably improved by the use of thoroughbred male animals. A number of them have been introduced into different parts of the county—some of them by private individuals, and some by agricultural societies. Our

Mr. White.]



GALLOWAYS.

societies have been doing a certain amount of good in that way, some of them bringing in one or two every year. The great bulk of our common steers, at two or three years old, are not as good as they should be for the old country market, but they are gradually improving. Grade steers are being raised and fattened for that purpose, while the inferior cattle are being sent to Buffalo. During the last three years there has been an increase in the number of pure bred bulls, and there are a number of farmers who are now going into the raising of thoroughbred animals

CATTLE BUYERS.

To Mr. Dymond.—Our cattle are nearly all raised here. We have many people who go through the county and buy cattle and take them away. The cattle are generally purchased right off the pasture in a rough state. They are generally kept on the pasture until three years old, though, sometimes, good two-year olds are bought. They are mostly good grades, though there are a good many native cattle. I generally keep enough rough stock to keep my farm sufficiently manured. I carry on a sort of mixed husbandry

DURHAMS—GALLOWAYS.

I prefer the Shorthorns to all other cattle. I have tried Galloways, I have two thoroughbreds of that breed, a bull and a cow. They are good to stand the winter, probably equal to our native cattle; but to improve our stock the Durhams are altogether to be preferred. The Galloways might be useful under some circumstances. As beefing cattle I find they are an improvement on our native cattle, but a cross with the Shorthorns is better. I have never had any thoroughbred Shorthorns myself, but there are a good many in the county, and there is no difficulty in obtaining the services of bulls. The price usually paid for a bull fit for service is from \$100 to \$200, and I think it would pay a farmer, with twenty or thirty cows, to keep one. There are many farmers in the county who keep that many for breeding and dairy purposes.

BEEF RAISING—CREAMERIES.

The attention of our farmers is chiefly directed to the raising of cattle rather for beef than dairy purposes. I don't think we have any creameries in the county, but I think if attention was paid to them they would pay better than cheese factories. Looking both to the dairy and to beef raising, I would prefer the Shorthorns, and I think they are the most profitable animal for the farmer to keep. Some of them are good milkers and some are not

COTSWOLDS AND LEICESTERS

To the Chairman.—The breeds of sheep that succeed best in improving the common stock are the Cotswolds and the Leicesters. I don't think the Cotswold is quite so hardy as the Leicester.

SOUTHDOWNS.

On account of the long wools going so low in price, I got some of the Southdown breed, and they are succeeding well. The lambs mature earlier than those of the larger breeds, and they are doing well. I get about 12 cents per pound more for their wool than for long wool. I have not tried them long enough to be able to give an opinion as to which is the most profitable, but the Cotswold is generally considered the most profitable for crossing our flocks with, on account of its size. I think, however, from what I have seen of the Southdowns, they will keep easier and thrive better on our land than the Cotswold, and they don't require so much food. They are not subject to any diseases that I know of.

[*Mr. White.*]

THE WOOL MARKET.

To Mr. Dymond.—There is a demand now for medium rather than long wool, so that wool grown from crossing the Southdown and the Leicester is more profitable than long wool. The Southdown is a very fine mutton sheep, and for that purpose brings more in the old country than any other. I crossed a few Leicesters with Southdowns last year.

SELLING THE LAMBS.

Some of our farmers sell their lambs in the fall; others keep them over. We get for lambs from \$2.50 to \$3. We would get \$6 for them when they are two years old, and, of course, we have to take into account the wool we get, as well as the expense of keeping them. I think when a farmer has good-sized sheep of the right kind it would pay him to keep them until they are two years old. A good many lambs are sent to the United States but most of the sheep are sent to England. Buyers cull out the best for the old country the culls being sent to the United States, or, if very bad, sold here.

EXTENSIVE SHEEP FARMING.

We have farmers who keep as many as 100 sheep. We have had a great many sheep in this county; the number has been reduced a little, but by getting the right kind we think that we can get the price. I have no doubt about sheep-breeding being an important branch of agricultural industry, and I think sheep are remunerative, though they are pretty hard on pasture. They are not hard to winter.

GROWTH OF WEEDS.

We have not very much trouble with weeds in this section of the Province, though there are some cases in which crops have been thinned by some cause—perhaps by the severity of the winter—and the weeds spring up, principally rag weed. Wild mustard is bad where farmers are careless. Red root is making its appearance, and the Canada thistle is increasing in some parts of the county.

THISTLE LEGISLATION A DEAD LETTER.

We have an Act of Parliament which makes it imperative for overseers to see that they are cut down, but it is not enforced to any extent. The overseers are liable to a penalty if they do not enforce the act. We have tried our best to get them to discharge their duties.

INFERIOR STALLIONS—LICENSING.

The councils should have power to appoint general overseers of the inferior stallions which are travelling through the country, and doing a great deal of harm by deteriorating the quality of our horses. Many farmers patronize them because the price of service is low. I think the time has come when no horse should be allowed to travel for service without a license, and that licenses should only be granted after a proper inspection. A great many people are not judges of a horse, and only use them because the price is low. I would be in favour of having an Act of Parliament making every person who travels a horse pay a license. You cannot always get people intelligent enough to judge what would be to their interests in the future. There are more small and inferior horses travelling to-day than there were years ago.

EMPLOYMENT OF LABOUR.

To the Chairman.—It is common in our district for farmers to employ labour. Upon a 100-acre farm, where there are no boys, I think the owner should have the services of [Mr. White].

two men besides himself in order to work his farm properly. Hired hands are sometimes engaged by the year, and sometimes for six or eight months in the summer. Our work in the winter is very light. When a man works by the year \$15 or \$16 a month is generally paid him; if he is hired for six or seven months he would be paid \$18. Harvest hands this year are paid about \$1.50 a day. I think the supply of labour is equal to the demand. Arrangements are often made for the employment of married labourers on farms. There are not many labouring men out of employment in the winter, except, of course, tramps. I think farmers generally are employing more men and working their farms better than they used to, but more labour might be employed with advantage. Immigrant labourers are not generally so efficient as those accustomed to work here.

FARM LABOURERS' COTTAGES—MACHINERY.

Very few cottages have been built on farms for the accommodation of married labourers. A four-roomed cottage, 20 x 24, frame, made in plain style, clap-boarded or weather boarded, would be from \$300 to \$400. The introduction of agricultural machines has affected labour in the harvest time very much, by lessening the demand for labour, and by making farm work less laborious and more easily and quickly done.

To Mr. Dymond.—I think more labour might profitably be employed on the farms of this district, though there has already been a considerable improvement in that respect. The introduction of machinery has led to the diffusion of more liberal ideas of farming in general, so that it results in the long run to the benefit of the labourer.

WINTER EMPLOYMENT OF FARM HANDS—WOODS.

All our labourers are employed during the winter in mills, etc., getting out timber for staves, bolts, saw logs, cordwood, etc. The chief woods which we have remaining are elm, black ash, and hickory, and on the higher lands beech, maple, etc. These woods furnish the supplies to the mills. A large quantity of elm timber staves is shipped to the other side. The reason immigrants are not so expert as our own men is just from inexperience with our implements and work, but we find no difficulty in training them in a few months. I am now speaking of English agricultural labourers.

To the Chairman.—I think the implements now in use meet pretty fully the requirements of Canadian agriculture.

IMPLEMENTS FOR DITCHING WANTED—FARM ACCOUNTS.

If we could get some means of doing our ditching more cheaply than those at present in use, I think it would be an advantage. I have never yet seen anything that is satisfactory for that kind of work. I know of a good many farmers who kept business accounts, and some who keep accounts for every field, but as a rule probably no such accounts are kept. I think it would be of advantage to farmers to take stock annually, but I could not say whether they do so or not. It would be a grand thing for the farmer, by enabling him to see whether he was making or losing money, and to what extent. If he found he was farming at a loss it would lead him to adopt other methods.

STEPHEN WHITE

MR. ALANSON ELLIOTT'S EVIDENCE.

ALANSON ELLIOTT, of Colchester, Essex County, was called and examined.

WHEAT AND CORN CROPS.

To Mr. Dymond.—I am a farmer engaged in mixed husbandry. Colchester is in the South Riding of Essex. I have been farming there about fourteen years, and am President of the South Riding Agricultural Society. I have been a member of the County Council for five years. Our crops consist chiefly of wheat and corn. My farm is a new one consisting of 100 acres, of which only about 45 are cultivated. It is rather from my general knowledge of farming that I speak than from the extent of land that I cultivate.

AVERAGE YIELD OF WHEAT.

There is more fall wheat growing in my neighbourhood than corn. Upon sandy land, such as I live upon, the yield of fall wheat is only about 20 or 25 bushels per acre, though sometimes as high as 40 or 45 is raised in the township. Our land is a high sandy soil, and does not require drainage. We are now cultivating more fall wheat than formerly and we also grow more corn.

PRICE OF FARM LANDS.

The land is only partially cultivated, as a good deal of it is in bush—what they call oak openings. A gentleman on a farm adjoining mine sold that portion of his land which had buildings on at \$60 per acre, and the rest at \$30 per acre. The average price of farm lands with buildings would be about \$40 per acre, though some farms with buildings would sell for \$60, on account of their location. Fall wheat has been successfully cultivated with us of late years. We never grew spring wheat to any extent in consequence of it having so often proved a failure. Fall wheat has not taken the place of corn at all.

AVERAGE YIELD OF CORN—PRICES.

The average yield of corn is between 40 and 50 bushels to the acre, and the corn crop pays us best as a rule. There is no danger in leaving a corn crop in the field all winter, as it will come out all right in the spring, only the fodder is lost. In some instances it is left in the shock all winter. Our seasons are somewhat mild, but if a heavy snow sets in early in the season we leave the corn out. We only grow tobacco in small lots, and we do not regard it as an article of commerce. I do not regard the crop as a profitable one. We do not grow any beans. Corn will average about 50 cents a bushel, though we get as high as 75 cents and as low as 35 cents. It is now worth about 43 cents. It was an extra crop last year. Very few peas are grown at all in our neighbourhood.

PEAS—ROTATION—CLOVER—DRAINAGE.

As long ago as I can remember, farmers used to send up to the Thames to get seed peas, as they were clear of the bug there; but they could only grow these one year, and then they had to send for more new seed. Corn grows so freely that we don't have occasion to grow many peas. Our rotation of crops is clover, corn and wheat. We find that the cultivation of the land for corn cleans it up for wheat, and on our sandy land we find that we have to keep the soil in condition with clover, because we use no manure but barn-yard manure. We regard clover as a means of recuperating the land and as sufficient to keep the land in good condition. I think mine has improved on that treatment.

[*Mr. Elliott.*]

We use what manure we have around the barn on the corn crop. I do not manure at all between corn and wheat. My land does not require any drainage, though some farmers have drained their farms. One farmer has used tile draining in one field, but it is not generally used. If the farm in question had not been drained he would not have had any wheat this year, and he had 25 bushels to the acre.

FRUIT FARMING—PEACHES—PLUMS.

I have a young orchard about six years old, and I am planting another. I have about 500 trees, and I intend to make my farm a fruit farm as I think it is particularly adapted to fruit raising. I have peaches as well as apples, and they thrive well. I have the Alexander, Amsden's June, Hales' Early and the Crawford. The last named does best with me. Hales' is subject to rot on the tree. We are not troubled with the curculio in the peach, but we have a grub something like the borer, which attacks the tree at the root, just at the edge. The remedy we apply is digging round the roots and taking the grubs out, and putting leached ashes around the tree. We find that these remedies answer the purpose. Practically we have no pest worth speaking of destructive of the peach tree. I have grown plums. I have had some trees planted a great many years, but I never had a crop until this year on account of the curculio. We adopted no means of destroying them except putting poultry in the orchard. I acted on Mr. Dougall's advice in doing that. I am not a member of the Fruit Growers' Association. None of our farmers have taken advantage of the Tile Drainage Act. All the draining that has been done in the townships has been done under the Municipal Act. The cost of raising an acre of fall wheat under the simple system which I pursue would be about \$11 an acre. I pasture my clover.

GRASS CROPS—CORN—STRAW.

To the Chairman.—I pasture clover the first year and the second year I plough it under for corn. We do not raise timothy hay because the soil is not adapted to it. The reason that we do not raise clover is that we have any quantity of corn fodder, and we like it best for winter food. I cut all my fodder with a cutting box.

To Mr. Dymond.—We sometimes sell corn straw in the fall for about \$4, and that may be added to the profit on the yield of corn. Fall wheat straw is worth very little.

To the Chairman.—I have ploughed corn stalks under for manure, but I don't think that they did any good. It would be worth \$4 an acre to plough them under on account of the stalks being so long.

CULTIVATION OF CORN.

Corn with us grows to an average height of ten or twelve, sometimes fourteen feet. I got some corn seed from Missouri which took the first prize at the State Fair in that State. It is dented at the end of the kernel, the same as the corn grown by dairy farmers for fodder. Imported corn has to be naturalized before it succeeds well. If planted this year it would be all right for next year's crop. The first thing we do is to plough the clover ground and harrow it, and this we do in the month of May; then we mark it out from three feet eight inches, to four feet each way, and we plant three, four or five grains in each hill. Some plant with a planter, but I do it by hand, as I tried the machines but did not find them at all satisfactory, as they are apt to plant too much. Then if you set them to drop only three grains to the hill, they will very likely not drop any at all. However a good many people in our neighbourhood use them, though our best corn raisers plant the corn by hand. I find the machine particularly unsatisfactory in planting large corn, as there seems to be no certainty of having the grains drop regularly, and you are unable to ascertain until the corn grows how it has been planted. We commence to cultivate as soon as the corn is up, just at the time

[*Mr. Elliott.*]

when we can see the rows from one end to the other. We cultivate it from four to six times, using a double shuffle plough—one shuffle coming behind the other. We never use the hoe at all. The plough throws it up in ridges to some extent. The shuffles are very small—very little larger than those of a farm cultivator. We work the plough with one horse. We cultivate from four to six times, say three times one way and three times across. Some days of course will intervene between these times of cultivating. Some use a harrow, but I do not. Some people use a two-horse cultivator, the horses straddling the rows. We manage to keep the weeds down by our method of cultivation. Some farmers use a single shuffle plough the last time of cultivating, and throw the land up in ridges. I prefer having it on the level. Heavy winds sometimes blow the corn to one side, but it generally straightens up again. The corn seldom suffers much unless it is a tremendous storm.

HARVESTING CORN—ELM BARK FOR TYING.

When we cut the corn we take hold of the stalks in a hill in the usual way. When we are going to put the ground into wheat, we generally carry twenty rows on each side, which leaves a space between the shocks of forty rows. That makes a wide land. The corn is then left until we get through the hurry of the work, and then we husk it. We tie the stalks round the top with elm bark. We use the bark of the common elm, as we have no rock elm. Sometimes we try fifty trees before we can get one to peel. We notch under the bark with an axe, and then hitch a horse to the end and let him do the peeling. It would not pay us to use wire, because we can get the bark for nothing, and a man and a boy can peel enough in a day to tie forty acres. We have about 20,000 acres of wood in our township.

HUSKING THE CORN.

We have no process of husking by machines that we find satisfactory. We found that it was as much trouble to take the corn to the machine and to carry away the fodder, as it would be to do the work by hand. We have hand husking machines. Our corn is much easier to husk than the Flint corn. Ours is the yellow and white Dent corn. We husk the corn from the shock in the fields, and put it in piles and draw it to the crib with a waggon. The spaces between the shocks are ploughed and put in wheat, leaving lands about ten or twelve feet wide where the corn is. When it is husked some stand the fodder on the wheat and drive along the spaces, and in the spring these spaces are ploughed up and put in oats. This accounts for the appearance of many of the fields in our part of the country—strips of oats appearing in our fields of fall wheat. We seed down again with clover on the wheat.

PRICES OF CORN.

Our surplus corn is sold at Walker's distillery at the prices at which he can import corn. It is the price of foreign corn plus the duty which regulates the price of our corn. The duty on corn has not helped us, because Mr. Walker laid in a stock of corn before the duty was put on, and he advertised last fall that he could not buy corn. That is, of course, an exceptional state of things. Mr. Walker informed me that he laid in a large quantity, perhaps 200,000 or 300,000 bushels. I think that we have got as much benefit as we will receive from fiscal charges on corn. It has been as high as 75 cents and 87½ cents a bushel. We have never had any corn shipped into the dairy districts, because we suppose Mr. Walker would give us as high a price as we could obtain there.

NEED FOR UNDER-DRAINAGE—WEEDS.

We have a good deal of land that would be benefited by under-drainage. The farm to which I allude as having been drained was a low quicksand, which used to

[*Mr. Elliott.*]

raise very heavy crops of rag weed, and the rag weed crowded out all other crops. The owner under-drained the land last season, and this year the value of his crop will be more than double his outlay for the drainage. He got his tile for \$10 a thousand, and he got the drain laid for 16 cents a rod. The tile was two and one-half inch tile. All of our land has a good natural fall. We have not much stone. Rag weed does not hurt a crop on good high land, though it comes up after the crop is off. It is far more troublesome on low land. It can always be got rid of by good cultivation, especially as it does not go to seed until after the crops are off. If the weed appears on a late field of oats it may go to seed. We have no other weed in our immediate neighbourhood that troubles us, but west of us the wild mustard is pretty well known. I think that underdrainage, by enabling a man to cultivate his land better, gets rid of the weeds; as the grain grows so well that the weeds do not have a chance. Wheat requires a dry soil, and rag weed a wet soil, and when you deprive the weed of its natural moisture, the wheat crowds it out. The gentleman I have already referred to drained eight acres, and he claims that he has already got his money back, especially as this has been a very wet season. Around Windsor they are troubled with the Canadian thistle, but not in our part of the county. In farming we follow the example of those of our farmers who have been successful. Before I began farming I was engaged in travelling through the country among the farmers for seventeen years selling agricultural implements and other articles.

BUTTER MAKING—PRICES.

To Mr. Dymond.—I don't raise any other cattle than heifers and milch cows. We just keep enough for our own use, and any surplus of butter which we have we sell to the pedlars who go round the country. We make our own butter, the amount being in the summer season about fourteen or fifteen pounds in a week. We get about 12½ cents per pound for it in the summer. We have no creameries or large dairies in our immediate neighbourhood, but there is one cheese factory in the township of Mersea. As a rule the butter about the county is bought up by pedlars. In the fall it averages about 20 cents per pound, and taking the year round it would average more than 15 cents per pound. If our farmers could get 25 cents a pound for their butter without the hard labour of making it by hand I think they would go in for butter-making extensively. I think creameries would be a great advantage to us. We would require an addition to the dairy stock of our township in order to run a creamery. I breed my heifers myself.

AYRSHIRES.

I used to use the Shorthorns, but now we use Ayrshires on account of their milking qualities. We have a thoroughbred Ayrshire bull in our neighbourhood, and my cattle are nearly pure bred. We had pure-bred Ayrshires twenty years ago, but we ran out of them, but now we are going in for them on account of their milk. When we wish to get rid of them they bring as much in the market as the common run of stock. They are a little better than our native cattle, because we cross them with pretty good Durham grades. I always put my cows to thoroughbred bulls, because if I do not want the calf I can make up for the price of service by selling it in the fall.

TRADE IN CALVES.

We do a large trade in calves in our part of the country. The hucksters buy them and take them to Detroit. These calves are sold at from three to eight weeks old, and they bring from \$3.50 to \$10. They average about \$1 a week. I let my calves suck the cow, as that is the least troublesome plan, and after the calves are taken off we milk the cows. We only let the calves suck the cow in the evening and morning; they are kept from them all day. We are using Ayrshire bulls, pure bred, on cows which are grade Durhams. Some of my cows might be put in the Herd Book. My experience is, that when you get a good strain in the Durhams it is an

[*Mr. Elliott.*]

extra good one, and I am crossing such a strain with the Ayrshire, as I think that will improve it. That of course is only my supposition. When I get a heifer calf which suits me in size and build I keep it. I am now speaking of grade heifers. I have had no experience which would enable me to say whether the cross between the Ayrshire and the Durham will produce a good milk cow, but I feel satisfied that the cross will not deteriorate them, and it may produce something better. It is also an object with us to produce calves which are as good beef animals as possible, so that they will sell well for veal. The selling of calves is a large industry with us, and conjointly with butter-making would make ours a good dairy district. We do not send milk to Detroit. Hucksters come round among us nearly every day, and most of our farmers sell the greater number of their calves, just keeping enough heifers to renew their stock. They raise very few steers. I keep only a few sheep.

SHEEP FARMING—PORK RAISING—PRICES.

In our neighbourhood we have a cross between the Cotswold and the Leicester, but now they are introducing the Southdowns for the purpose of getting a shorter wool. In Detroit they are not very particular as to the quality of the mutton, as Merino mutton, which is the poorest of all, is often sold there. Ours is a great pork raising district, and we find the industry a profitable one. Our average price would be about \$6 a hundred weight, and pork pays well at that price. We would not consider ourselves losing even at \$5.

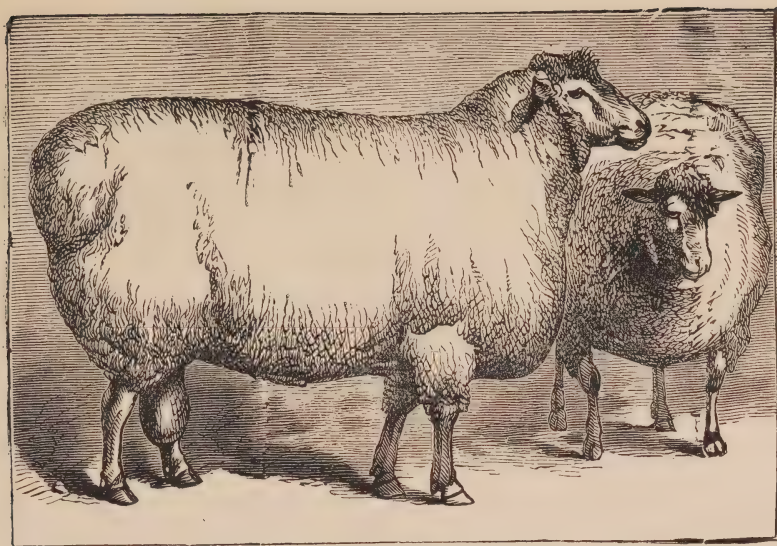
DESCRIPTION OF HOGS PREFERRED.

I prefer a cross between the Berks and the Suffolk or Essex. The Essex is a small, compact animal, which fattens well. Our pork is shipped east, a great deal of it being sent to Aylmer, where it is packed. Montreal buyers also take a good deal, and I suppose it goes to the States. Buyers say that we produce the best pork in Canada. By crossing the Berkshire on the Essex we get a smaller animal but a finer grade, the meat being fatter but not so coarse. I think such a cross would produce pork well adapted to English consumption. We had a pork packing establishment in Windsor some time ago, but it failed. They bought for the English market, and they preferred hogs leaner than ours. Farmers occasionally import and keep thoroughbred animals of the Essex and Berkshire breeds for breeding purposes. Messrs. Wright and Butterfield, two of the most successful thoroughbred breeders in Canada, have done a great deal towards improving our stock for the last few years by the introduction of thoroughbred male animals. There are a very few native hogs to be found amongst us now except a few amongst the French.

POULTRY RAISING—EGGS.

I am engaged in raising poultry to some extent, and keep a few hens for their eggs. As a farmer I prefer the Leghorns and the Hamburg; these are better egg-producers than the Light Brahmas, though I keep a few of the Light Brahmas for mothers, as they are good sitters. Mine are about half bred. The Hamburgs are small fowls, but they lay a large egg for their size, and in respect of the number of their eggs they are similar to the Black Spanish. I have never tried crossing the Brahmas with the Game. Our eggs are shipped east, and there is a Chatham firm which travels through the country and collects the eggs for exportation. We are now getting 10 cents a dozen for them, but they run up as high as 20 cents, and the average price would be almost 12½ cents. The Leghorn is not considered a table fowl, but it is kept for its eggs. The Light Brahma crossed with the Dorking makes a good table fowl. My chickens are now dying with the chicken cholera. I have given them pepper and other things, but without producing any good effect. It affects well-bred fowls worse than others. It commenced with the Buffs and then spread among the other breeds. I keep all the different breeds in separate yards. In the fall of the year I let them run out, but in the spring I shut them up.

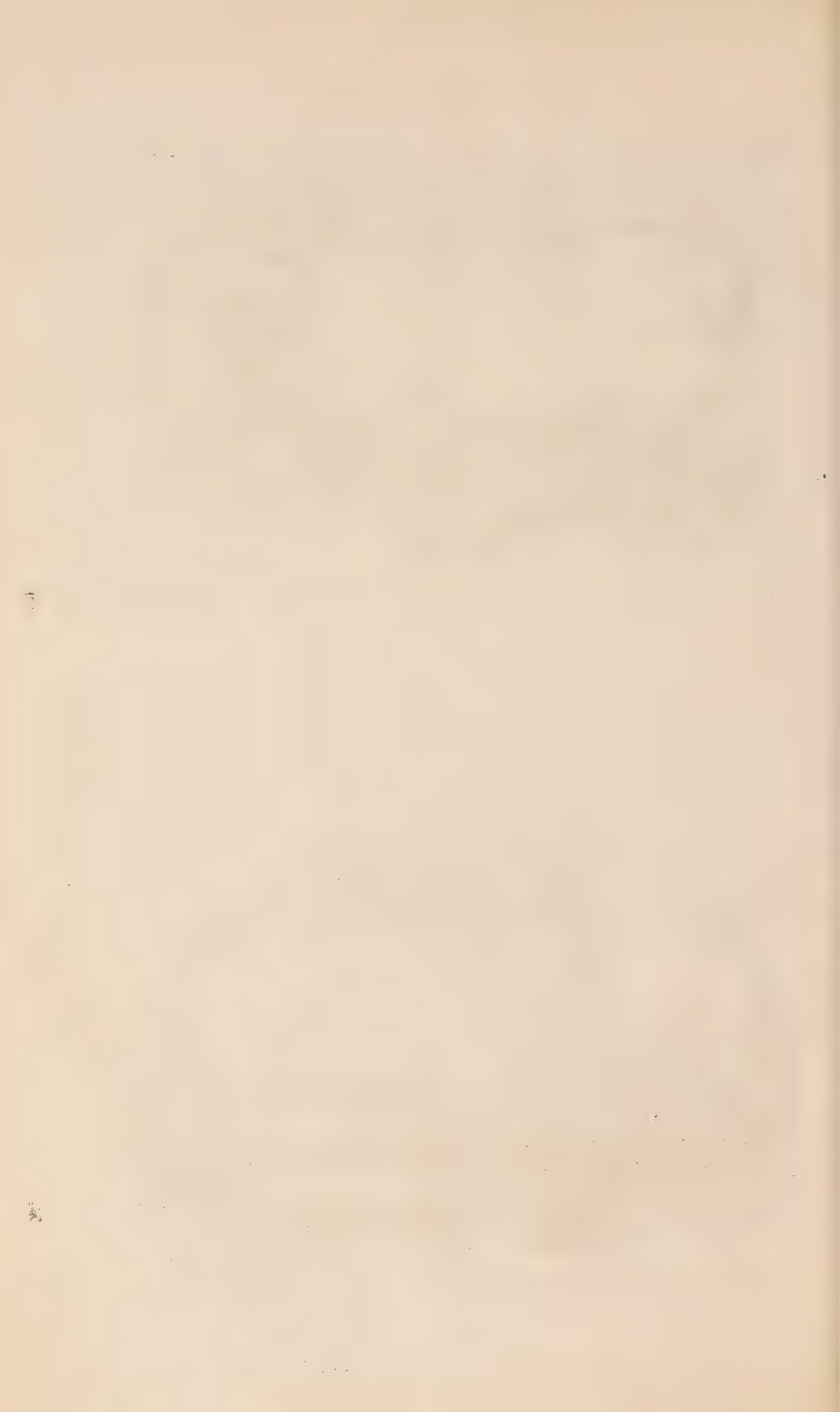
[Mr. Elliott.]



COTSWOLD RAM AND EWES.



LEICESTERS.



USE OF SALT.

I use salt for feeding stock, but I do not use it as a manure, though some of my neighbours are beginning to do so. A cargo of salt arrived in our neighbourhood not long ago; it is Huron salt, and sells at \$4.50 a ton. Some use it in the spring, and some use part in the spring and part in the fall. Those who have used it upon sandy land say it is a protection against the drought, and that on low land it kills the wire worm. Sandy land suffers considerably from the dry weather, but working it up and planting corn tends to keep it moist.

HORSE RAISING.

I do not raise any horses. There are a good many of my neighbours who raise them, the farmers round averaging three or four brood mares. They are improving the stock, some of them using thoroughbreds. We have no thoroughbred horses except the Percherons, but we have some half-bred Clydesdales and some young Netherberrys. We have also some trotting stock. On the whole the quality of our stock is improving.

CULTIVATION OF SORGHUM.

To the Chairman.—We cultivate just about enough sorghum for our own use. One man has four or five acres, and he makes it for those around him, charging them 15 cents a gallon. It is raised just about the same as a crop of corn. Sorghum yields from four to six barrels of thirty-two gallons each per acre. The most we have sold it for is 50 cents per gallon, out of which we pay 15 cents for manufacturing. That would be about \$60 per acre. We consider it a profitable crop to raise, though the demand is not sufficient for us to go into it largely. Our syrup is not as good as the golden syrup, but it is much better than the old West India molasses, and only requires refining to make it of excellent quality. We cannot raise wheat after sorghum, because it comes in too late. We sometimes leave the sorghum in the ground till the frost comes, because we find that the quality of the syrup is improved by a slight touch of frost. If we had a certain market, at \$40 per acre, it would be grown more largely; but, if we were selling it to wholesale men the price would be reduced, but it would pay at a wholesale price of even \$30 per acre. We plant corn after a sorghum crop, but we do not plough it in the fall, because it is too late. The roots are a little more compact than corn stubble, but they do not give us any real trouble. In the first place the plant is stripped of the leaves, which are left on the ground and fed to cattle; then the seed is cut off and the stalks are put up in piles and hauled to the mill. Some are tied up in bunches. It has the appearance of broom corn more than anything else, and is liable to mix with that plant if they are growing side by side. If growers were content with a smaller profit, I think the market might be extended considerably. Nothing is done with the refuse at the mill; it is either left to rot or is burnt up. It is said that the amber cane can be manufactured into sugar, and that is an earlier crop than sorghum, though, perhaps, a little late to follow it by a wheat crop. We could not raise sorghum so that it would take the place of the better class of syrups.

THE STANDING TIMBER.

To Mr. Dymond.—We have a large amount of land which has not been cleared yet, but is covered with oak, elm, black ash, hickory, balm of Gilead, etc. The timber is being taken off for manufacturing purposes. The balm of Gilead is made into bolts and staves. The manufacturing of wood is an important industry with us, in one block of woods in this township there are nine saw mills. Our trees are principally deciduous.

SAWDUST AND LIME AS MANURES.

We don't use the sawdust from these mills for manure. At one time I bedded my horses with sawdust from the mill, and I afterwards hauled it out on the land, but I
[*Mr. Elliott.*]

imagined it injured the soil, perhaps because my soil was open. Last year I tried some lime, but I have not seen much effect as yet, though my clover which followed it looked well. I put about 150 bushels of lime and 150 bushels of ashes on three and a half acres; so that, perhaps, I put on too much. Though the first crop was not a very good one, it is possible that I may get the benefit of it in the future.

MANUFACTURING INDUSTRIES.

We have no unemployed men, because all our labourers can get good wages in the lumber woods in winter. In connection with the industry I have been referring to, they can get from \$15 to \$18 a month, and board, in the winter. In the summer farmers pay about \$17 a month, with board and washing. Ours is a good section of country for labouring men, and the demand is in excess of the supply, so that we have to go down to Montreal to get Frenchmen for the lumber woods. Our square timber is mostly got out by French Canadians, and they are preferred, because they are more docile and stay at home better than other labourers. English immigrants are not a success in the lumber woods, as they are not used to that kind of work as the Frenchmen are. The Englishmen are more at home in ditching and work of that kind.

RECLAMATION OF MARSHY LANDS.

We have about 8,000 acres of marshy land that has been reclaimed in our township by open drains. It was absolutely worthless before it was drained, except that, in the middle of the summer the cattle could run upon it for a short time. Mr. Walker has a large marsh of 1,800 acres, from which he gets every year 1,200 or 1,400 tons of hay. He does not wish to drain it, because he claims that freshets from the uplands are as good as a coat of manure. Sometimes our marshes take fire, and the turf burns off them and then there comes up a growth of small poplars. Sometimes the soil burns off to the depth of eighteen inches. With the exception of Mr. Walker's land our other marshes have been reclaimed. As to the value of this reclaimed land, I know one man who paid \$1,000 for 40 acres. Another man gave \$1,500 for 50 acres, and another paid \$20 an acre for 200 acres without any buildings. Such land is worth \$20 an acre; with buildings it is worth about \$30. Corn is the principal crop growing on such land. All the drainage in the township of Colchester done under the Drainage Act has been done this last five years. Some have grown wheat on these reclaimed lands. In one case, in which a suit was brought against this municipality for bringing down water on the plaintiff's land, the plaintiff valued his crop at \$22 an acre. A great many acres of upland have been benefited by the drainage, and the lowland was worthless before for agricultural purposes. It used to be the custom to drain the upland right down into the lowland. We have two drains, twenty feet wide and three and a half feet deep on the average. It is not expected that tile-drains will be run into those open drains, though it would be an advantage if they were. Open drains are being used at the present time. Some of our marshes have evidently all been timbered lands some time in the past, as the old stumps and timber can be found in the bottom.

EFFECTS OF DRAINAGE ON CROPS.

Our county is very healthy at the present time, and we scarcely ever hear of ague since the land has been cleared up and drained. Our district is so level that we have one ditch which has only two and a half feet fall in three miles. The township of Mersea is to-day the best wheat-growing township in our county, but it was almost worthless before it was drained. Where the bulk of the wheat is growing now it could not be grown at all before. I suppose the township of Mersea has spent \$150,000 in drainage. The people are paying for these drains in taxation now, but they do not find it burdensome in view of the benefits they have received.

[*Mr. Elliott.*]

FRUIT CULTURE.

Of apples, all prefer the winter varieties, as we have no market for summer fruit. The favourite varieties are the Rhode Island Greening and the Northern Spy. Chicago is our market, the buyers coming from there and buying them up at \$1.25 to \$2 per barrel. We have a large number of trees in bearing condition. Mr. Wigle, of Gosfield, informs me that he took nine barrels of Greenings from one tree, but that is an extraordinary case. His trees are well taken care of, and he has the best orchard in the township. I think the borer troubles the Baldwin more than other trees. Strawberries are grown largely in Mersea, principally the Wilson variety. The soil is well adapted to strawberry culture, and they ship large quantities to Windsor, Detroit and Amherstburgh. The people are beginning to cultivate raspberries, though we have a great many wild ones. The birds trouble us a little, but we have nothing to say against them. In our old cleared land the wheat is all sown by tube-drills, but in new land it is sown broadcast. I think that in a hard winter wheat that is sown with a drill keeps better than what is sown broadcast. Our wheat is sometimes killed in the spring from being heaved up by the alternate freezing and thawing. Clover suffers in the same way.

CATAWBA.

Smith and Williams are the largest grape growers on Pelee Island. The principal grape that they raise is the Catawba, which ripens every year on the Island. They ship their wine to Brantford, and they made 7,000 gallons of Catawba wine last fall. The first grapes were planted on the island in 1863, some gentlemen having come during the American War and located on the island. One gentleman named Wardrope has about twelve acres of Catawba grapes; Smith and Williams have about thirty-five acres. They grow the Concord and other varieties to some extent, but wherever the Catawba can be grown it is preferred. We have tried the Catawba on the mainland, but it only ripens once every few years

ALANSON ELLIOTT.

MR. J. C. ILER'S EVIDENCE.

J. C. ILER, of the Township of Colchester, was called and examined.

AGRICULTURE IN ESSEX.

To Mr. Dymond.—I am a farmer and have been engaged in farming about thirty years. I have 215 acres of land, of which about 150 are under cultivation; the rest is bush. I am engaged in mixed husbandry—stock-raising as well as grain-growing—and I have a general knowledge of the resources of the County of Essex.

WHEAT CROPPING.

Fall wheat is our main crop. I have cultivated fall wheat ever since I have been farming. Spring wheat has not succeeded recently, though it did many years ago.

FAILURE OF SPRING WHEAT.

Thirty years ago we could raise 25 bushels to the acre, but we fail to do that now. I do not grow any spring wheat, and I don't think it is raised to any extent in the county.

[*Mr. Iler.*]

A FINE FALL WHEAT SECTION—CORN.

I consider our county a fine fall wheat section, and we grow a good deal of corn as well. The amount of corn grown has been increasing for the last ten years, and I think it now occupies about one-half the number of acres that fall wheat does. We have tried very many different varieties of spring wheat, but without success.

HOW THE SPRING WHEAT IS AFFECTED.

To the Chairman.—I cannot say what is the cause of the failure of spring wheat. It will grow up pretty well in many instances and then it will be seized with a blight. I don't think the Hessian fly is the trouble just now, though we had it some years ago.

VARIETIES OF FALL WHEAT.

Of fall wheat, we grow principally in our county the Scott and Clawson varieties, and some Deihl. The Scott is the favourite I think, and I don't think either it or the Clawson is inclined to rust. I think the Clawson ripens a little earlier than the Scott. The Scott is considered the most valuable for the market, though the Clawson is a hardy wheat. Just now there is more Clawson in the county than Scott, but the general opinion is that the people will go back to the Scott.

HEAVING-UP OF THE PLANT—SALT—A CUT-WORM.

When we have a failure of the crop it is generally caused by the heaving up by the frosts in the winter. When we have open winters it gets killed in that way. Salt has not been used largely, though it has been to some extent. Some consider it a remedy for a sort of cut-worm that we are sometimes troubled with. The growth of fall wheat is increasing in our county, and it is producing larger crops.

EFFECT OF CLEARING ON THE LAND.

Our land is of a good quality; the effect of the removal of our forest trees has been in some instances, where fields are much exposed to the winds, to sweep off the snow and expose the crop to the cold of winter. I have noticed that fields give much better crops when they are protected on the north and north-west.

CLOVER SOD AS A SEED BED.

We generally turn over clover sod and use it as a seed bed. The right way to prepare it is to plough it about July or the 1st of August, turning the sod down as well as possible, harrowing it well, and keeping it clean until seed time by cultivating. Some sow their grain immediately after ploughing down, but I don't think that is the proper way. I think when there is a good deal of clover the clover should lie a long time, as it is too hot for immediate sowing. In many instances we sow clover and plough it under after cutting it. Only about one acre in fifty of fall wheat is sown on summer-fallow—practically none at all.

WHEAT ON CORN GROUND A FAILURE.

The Fall wheat in our county is generally sown on clover sod, pea ground, or barley or oats stubble, and to some extent on corn ground; but sowing it on corn ground has proved a failure with me. We frequently can get corn off in time to sow fall wheat. From the 10th to the 20th of September is about the right time to sow, but some sow later; there is a good deal sown between the 20th of September and the 1st of October.

[*Mr. Her.*]

UNDER-DRAINING.

Under-draining has not been much practised with us for the purpose of preparing land for fall wheat until quite recently, and even now it is rather in its infancy. Tile is mostly used now, though at first the drains were made of stone and timber. The draining has been mostly done in low places or hollows.

ARTIFICIAL MANURES.

We use very little artificial manure. Some parties were around selling the right to use a certain kind of manure but it turned out to be a fraud, as the farmers were induced to give their notes, but they did not get the superphosphates. Lime has been used as a fertilizer in some cases with pretty good results.

COST OF RAISING FALL WHEAT—AVERAGE YIELD.

I would estimate the cost of an acre of fall wheat crop as follows: interest or rent, \$2.50; preparation of land, \$2; seed, \$1.50; sowing and harvesting, \$2; threshing, \$2; other charges, \$1. Total, \$11. Our yearly rent for clear land is about \$2.50 per acre, and I base the amount for interest on the idea that land is worth \$40 per acre. I think the average yield is about 20 bushels to the acre.

DRILL SOWING.

Leading farmers sow altogether in drills, and the general opinion is that drilling is best, though there is a good deal of broadcast sowing yet. I use about one and a half bushels to the acre for drill sowing, and about two bushels is required for broadcast sowing by hand. I could not say that I have noticed any decided difference in the crop between broadcast and drill sowing; this year especially it all seems about alike.

A FAIR AVERAGE ALL OVER.

To Mr. Dymond.—When I speak of 20 bushels per acre being the average I mean all over the county. My own average for the last two or three years has been about 25 bushels to the acre. I consider about 25 bushels a fair average for all sorts of ground, though with proper cultivation it would be more. When I gave you an estimate of the cost of cultivation I gave the average as the land is usually cultivated. I think it is a profitable crop under proper methods of cultivation.

COST OF FARMS.

A first-class farm can be purchased for \$40 per acre with fair buildings, but not allowing anything for such improvements as under-draining, etc. I think in many instances the crop would be increased by under-draining; I have seen important results produced in that way, but my own land is naturally well drained.

WHEAT GROWING.

I think \$11 per acre is a fair estimate of the cost of growing fall wheat in our district, though if the ground were fallowed and worked up two or three times it would be different. I find that fallowing does not pay me, especially as my land is free from weeds. We seldom cultivate wheat after corn, as I think the cultivation of corn makes the ground too loose for wheat. Some cultivate the land after corn without ploughing, and sometimes good crops are obtained.

[*Mr Her.*]

RECLAIMED LAND—SOIL—CROPS.

The wheat land in our county is usually a black loam with clay sub-soil. A good deal of land has been reclaimed in our county, and is now used for growing wheat. I have sometimes seen these marshes broken up and wheat sown immediately, but in a wet season the land is apt to be too wet for wheat. I would not recommend the growing of wheat on land immediately after being reclaimed, but would prefer planting corn one year at least, so as to get rid of the turfy condition of the soil. We don't use lime at all on these reclaimed lands.

COST OF MANURE.

In estimating the cost of a fall wheat crop at \$11 an acre I did not make any allowance for manure. In preparing the land we usually do manure, and that would cost perhaps \$3 per acre for putting it out on the land. We use no manure but what we get on the farm. Sometimes we manure on clover sod, but generally on stubble.

USUAL ROTATION.

To the Hon. Mr. Wood.—We do not always follow a regular rotation of crops, but we have a sort of rotation. After sowing fall wheat on sod I would plant corn, then oats and then wheat again. In the course of that rotation I would manure just as often as I had the manure to put on. We often manure both for the wheat and the corn, and in that case the manure would have to be charged to both crops.

SANDY SOIL BUT FERTILE.

To Mr. Dymond.—There is a considerable amount of light sandy soil in our county, and it is producing almost as well as other soil when it is well manured and worked up. In some instances we get 40 to 50 bushels of wheat to the acre, and when I gave the smaller figure I was speaking of the average. I have known 40 bushels per acre grown for a succession of years, and I have known crops to yield as high as 55 bushels to the acre, in one particular year, about thirty years ago.

FIRST-CLASS FARMS—PRICES.

To the Chairman.—The character of the buildings on our farms varies very much, but on a farm that would sell for \$40 an acre the buildings would not be very good. On such a farm the house would very likely be frame and old, and the fences would be old rail ones made of chesnut, swamp ash, and oak timber. I don't think a good 100-acre farm with pretty good buildings, and well fenced, could be bought for \$4,000. A first-class farm with good buildings would cost from \$50 to \$60 per acre. Some of the best 100-acre farms that occur to my mind, with good buildings on them, would be worth \$5,000 or \$6,000, and when I spoke of \$40 an acre I was speaking of the average.

NOXIOUS WEEDS.

We are pretty free from noxious weeds, though in some parts of the county we have Canada thistles and wild mustard. We have also a little pigeon weed and some rag weed. We have also some tares in some parts of the county. They grow among the wheat. We have had no trouble in eradicating rag weed, as all that is necessary is to plough it under. If it is allowed to ripen I suppose the seed would spread, but ploughing it under kills it thoroughly. Clover sod is ploughed about the middle of July, which I consider the proper time, but some plough it later.

[*Mr. Her.*]

ONE PLOUGHING FOR CLOVER SOD ONLY.

I would not plough the sod up the second time, but I would prefer harrowing it, and making it as smooth as possible, and then let it lie until seed time, when I would use the cultivator. In following fall wheat with corn it would not be necessary to manure in all cases, though it would in some. It would depend upon the quality and condition of the land.

BARLEY.

Barley is not much cultivated with us ; in fact there is very little in our township. The reason is that, like spring wheat, it does not seem to do very well. Its cultivation is rather decreasing. The cost of raising an acre of barley would be about the same as an acre of wheat.

OATS A GOOD CROP—RYE.

Oats are grown extensively with us, and they are a good crop, but the price is so low that farmers only raise for their own use. The average crop per acre would be about 40 bushels. All the different varieties grow well with us. We require more oats for home consumption than formerly, but the price is so low that it does not pay to sell them. Rye is not very extensively grown, though it is sometimes raised for fodder.

PEAS—THE BUG—MILDEW.

Very few peas are grown, owing to the prevalence of the pea bug. We have been troubled with it for a long time. On heavy soils peas are also liable to mildew. I think a large portion of our soil is too rich for peas, as they grow to vines too much, but in other portions of the county we could raise them profitably but for the bugs.

To Mr. Dymond.—The bug is worse than it used to be, I think, and is increasing year by year. The only means adopted to get rid of the bugs, is to cease growing peas, and that means has been pretty generally adopted. I think that is the only way of getting rid of them. The bug is troublesome all over the county. I don't know that there has been any co-operation for the purpose of killing the bugs. In our neighbourhood we have ceased growing peas by general consent, but I don't know how it is in other parts of the county.

LOCAL ASSOCIATIONS AND THE PEA BUG.

I don't think the Agricultural Associations have taken the matter up—in fact they do not discuss such matters ; their work is generally confined to getting up shows. Their annual meetings are not very well attended.

GROWING INDIAN CORN.

To the Chairman.—We grow corn largely. It is grown for the grain in ninety-nine cases out of one hundred—very little being grown for fodder. The crop is usually successful, and the average per acre about forty bushels. The varieties generally grown are the large yellow and white Gourd Seed, though the yellow and white Flint are also grown. These are eight-rowed varieties. Corn has been badly injured by the rain, but I don't think it can be said that the corn crop is subject to failure in our part of the county, though late corn in back settlements is sometimes nipped by the frost. I think that our county can produce corn successfully, and I don't know that we have any regular failures.

MARKET FOR CORN.

We don't have any large quantities to export, but sell it to our local traders and distillers. Mr. Walker takes about all the corn we can raise for his distillery. It is not necessary for us to import corn from the United States, though very small quantities are imported.

[*Mr. Her.*]

COST OF RAISING CORN—HUSKING.

There is not much difference in the cost of raising corn and wheat. We have no husking machines in our county. We put it up in shocks, and husk it by hand.

CORN CRIBS AND CORN HOUSES.

We store it in cribs; a great many of them are built out of poles, but some are now building corn houses of lumber, leaving cracks for the circulation of the air. Good corn houses are generally built double, each side being about four feet wide and eight or nine feet high, with space between sufficient to allow a team to pass through.

CORN PLANTING.

The larger varieties of corn are generally planted with three feet eight inches between the hills, and three stocks to the hill. That is about the right distance, though it is sometimes planted thicker. Flint corn may be planted three feet six inches between the hills, and four to the hill.

PRICE OF CORN.

To Mr. Dymond.—Corn usually realizes about 50 cents per bushel, taking one year with another, and we consider it a profitable crop in our county. A great deal of it is used in feeding hogs and cattle, and it is the surplus which the distillery takes.

FEEDING PIGS WITH CORN.

We feed pork considerably with corn, and that industry can be successfully carried on in Essex. Pork raising is profitable if we get \$5 per cwt. for it, but it is not profitable at any lower price. We average pretty much about that price for our pork, so that I consider the industry profitable. Farmers who have 100 acres, generally keep, for stock and fattening, about forty hogs.

BREEDS OF PIGS.

At present our hogs are generally pretty well bred. We have two or three breeds; the Essex, the Suffolk, and the Berkshires, and some have paid attention to Poland Chinas. I think a cross between the Berkshire and the Essex, is better than either of these two breeds, as they come to maturity sooner, and fatten more readily. Pork feeding is rather a local and peculiar industry with us, owing to the large area of corn which we cultivate. Some farmers fatten as much as 9,000 lbs. of pork in a year. The average number of hogs fattened on a farm of 100 acres would be about twenty, and twenty more are kept over.

CORN CROP NOT EXHAUSTING.

I don't think corn is a particularly exhausting crop if a proper rotation is observed, though it might prove so if corn were planted for a succession of years on the same land. The corn which we grow is similar to that which comes from the United States. We are increasing the area under corn, and I don't think the profit in growing wheat has decreased the quantity of corn. The production of the pork is not increasing very much.

EXPORTING HOGS.

We generally export our hogs; for, though we have a pork packing establishment in Windsor, it is on a small scale. I think it would be more profitable if we had the packing industry carried on in our own district.

[*Mr. Her.*]

PRICE OF WILD LANDS.

The average price of wild land, well timbered, is just now about \$15 per acre.

CORN STALKS—CARE OF MANURE.

To the Chairman.—We feed corn stalks to cattle in the winter. We generally put them in stacks, though some put them in their barns. We don't usually cut the stalks. I don't think any special pains have been taken to utilize the manure from the hogs; the general practice being to put them in the field so that the manure gets mixed with the mud. The best farmers are paying some attention to preserving their manure, but even they do nothing more than putting it in the general pile. There is a general improvement in the treatment of hogs while fattening, with regard to pens, etc., and there has been a great improvement in the stock itself. I don't know of any who use swamp muck or cut straw for the purpose of enlarging the bulk of the manure from hogs.

CORN AS FODDER.

The fodder from an acre of corn, well saved, is equal to the hay from the same quantity of land. I should consider if it is well cured and looked after, the stalks should be worth \$4 to \$5 per acre.

SALT AS MANURE.

To Mr. Dymond.—I have heard of salt being brought into our county lately, but I have had little or no experience with it. It has been put on fall wheat with the idea of assisting the growth, protecting it from rust, and killing the worms. I think it was Canadian refuse salt, costing from \$4 to \$4.50 per ton. It comes by water to us.

LANDS RECLAIMED—INCREASED VALUE.

We have done a great deal of drainage under the Municipal Act—something like \$30,000 worth in our township alone, and a large amount of land has been reclaimed in this way. That land was bought before it was drained, at about \$4 or \$5 per acre, by its present owners. I know of such lands selling now at \$20 per acre, without any improvement except the drainage. I know of another instance in which a man who bought in this wet land for \$8 per acre, has been offered \$3,200 for one hundred acres, and I should think that it was worth fully that amount. The price of such land generally averages from \$20 to \$30 per acre. The general impression is that the money spent in this drainage has been money well invested, and has added largely to the wealth of the whole county. Local drainage was impossible, until these Government drains were carried out. About three-inch tiles are generally used in tile draining.

IMPROVED FARM STOCK.

To the Chairman.—The stock in our district have been largely improved by the use of thoroughbred males. As to the prospects of a supply for two or three years, I think we can produce cattle enough, though at present there is not much demand for them. There are a good many young ones coming in. The Agricultural Societies have introduced them, but a great many private individuals own them now, and there has been a very great improvement in the stock. I am now referring to thoroughbred bulls. The usual fee for the service of a thoroughbred bull when put to common stock is about \$1.

THE DURHAMS MOSTLY USED.

The breed of cattle used for improving our stock is mostly the Durhams, though some have used the Devons, the Galloways, and the Ayrshires. The Galloways are not generally used, and I don't think they are favourites. I have tried the Durhams, and the Devons.

[*Mr. Her.*]

THE DEVONS.

I like the Devons pretty well, but they are rather small, though they are good for draught purposes. They are not at all wild or troublesome to manage, though they are not so docile as the Durhams, but they are easier to keep in flesh, and stronger according to their weight than the Durhams. Even for draught purposes, they would be better with some Durham blood in them, to give them size and strength. I think the Devons are rougher feeders than the Durhams, and rather more active.

BEEF RAISING—DAIRYING.

The stock business with us is principally carried on for the purpose of raising beef. Dairying is not carried on to any great extent, though we have some small cheese factories. I should think that Essex is well adapted for cheese making. Our butter is all made by hand at private dairies, and is used in the local trade. Some of it goes to Detroit, as that is our market for almost everything.

PRICE OF BUTTER.

Our butter has been principally taken up by pedlars for the last two years; they go around with goods which they exchange for the butter. Through the summer we get $12\frac{1}{2}$ cents per pound, and through the winter from 18 to 25 cents; the average would be about 22 cents. I don't breed cattle myself very much, but I buy most of them, though I breed a few.

COMMON STOCK UNPROFITABLE.

In breeding I have used thoroughbreds altogether for the last few years. I don't like to use any others if I can help it. I think there is no difficulty in obtaining the services of a sufficient number of thoroughbred animals. Common bulls are very little used. I don't think it is profitable to raise a common animal to three years old, if one can be got which has one or two crossings from thoroughbred stock.

STOCK FEEDING.

Our grade steers at three years old do not weigh more than 1,000 lbs., live weight, that is grades of one or two crosses. We generally starve them pretty well for the first year, and starve them for the next two years, and give them all they can eat for the last few months that they live. That is the common system in our county. It is not very profitable to raise cattle when we can only get them to weigh 1,000 lbs. at three years of age. I know that the demand in England is for steers weighing about 1,400 lbs. at three years old. I don't think any of our cattle go to England, unless Mr. Walker sends them from his distillery. Stock raising has not received as much attention in our county as it has in others. I attribute this state of things to the fact that we have been paying so much attention to pork raising.

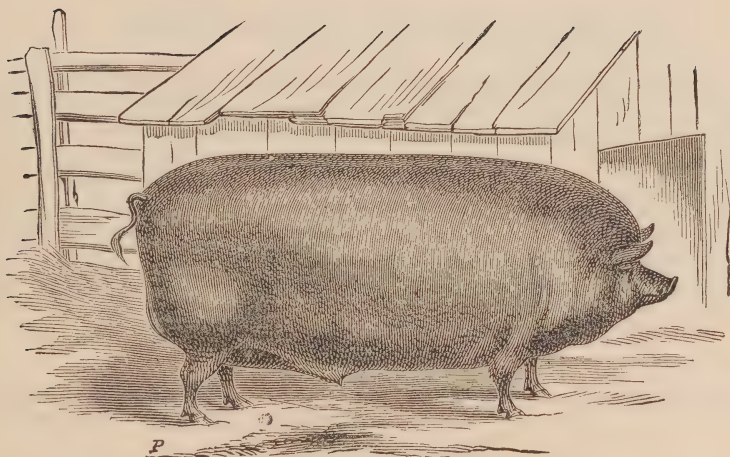
SHEEP FARMING.

To Mr. Dymond.—I have paid some attention to sheep raising. The Cotswolds and Leicesters are the favourite breeds, but the Southdowns have been lately introduced. It is thought that they will make a good cross with the Cotswolds and Leicesters. We do not ship sheep to England. Lately the demand for medium wool has been greater than before, and farmers for the last few years have been mixing their sheep a good deal with the Southdowns. I think the most profitable breed of pigs is a cross of the Berkshire on the Essex. I think food for pigs should be ground and cooked.

[*Mr. Her.*]



POLAND CHINA.



ESSEX BOAR.



POLAND CHINA PIGS.

To the Chairman.—The Poland China I have had no experience with myself, but my neighbours think that they are larger than either the Essex or the Berkshire, and they seem to fatten readily. I have rather taken a dislike to them myself, because they are rather rough looking. Still I believe they are good animals.

CHESTER WHITES—SUFFOLKS.

I have had some experience with the Chester Whites, but they are rather coarse, and don't fatten early enough to suit us. The Suffolks are too small, and they have too much fat in proportion to the lean. The weight of our hogs, taken in lots, is about 300 pounds; that is a good average, though some reach more—they would then be about twenty months old. I think it is most profitable to have them come in early and fatten the same season, though some think it is better to let them run on the clover and keep them over winter.

PROFITABLE WEIGHT OF HOGS.

I think a hog that can be made to weigh 200 or 250 lbs. at one year old, is more profitable than one at 300 lbs. the next year. For packing purposes a pretty large hog is preferred, even if it is a little coarse. The different weights I have been speaking of, are all dead weights; live weights would be about one-third more.

HORSE BREEDING.

To Mr. Dymond.—We raise a good many horses, and generally they are a pretty good class. We have introduced thoroughbreds, some Clydes and others. I have bred some; I prefer general purpose horses. We get that kind of a horse by mixing the English coach horse or thoroughbred race horse with the ordinary mares of the country, and these also make very good roadsters.

ROYAL GEORGES—ST. LAWRENCES—HAMBLETONIANS.

The strain I prefer to breed from with the common mares would be the Royal George or St. Lawrence. I don't know much of the Hambletonians, but I don't like them as well as the others. Generally the Hambletonians are pretty well liked, but I don't think they are so hardy, or have so much action as the Royal Georges. I do not think that they are as well marked, and their fore legs are rather too close together. They are favourites for trotting purposes. The roadster which we require in this country is one that will go a mile in about four minutes, or about fifteen miles an hour. I do not know of any particular market for those horses, but they can always be sold readily. A good looking horse of that speed, and of a fair size, would be worth from \$150 to \$175. Such a horse should be sixteen hands high.

GENERAL PURPOSE HORSES.

For a general purpose horse, either the Percheron or the Clydesdale should be crossed with ordinary mares of pretty good action and style.

THE PERCHERONS.

We are importing some of the Percheron breed from the United States and France. The reason they have been imported is to give those raised from the Clydes a little more "snap," as the Percherons are considered to have a little better muscle and action. They are also harder than the Clydes, and are fully as heavy. I think they came originally from Normandy. Two stallions have been imported from France. Mr. Walker's cost, I [Mr. Her.]

believe, \$3,000 in France, and Mr. Rankin's, \$2,000. These horses are considered more intelligent than Clydes, and the two I have mentioned are exceptionally fine animals. I don't know at what price a good ordinary stallion for service could be bought in France. For the services of these stallions one of these gentleman charges \$20, and the other, \$30.

INFERIOR STALLIONS.

The use of inferior stallions, because they are cheap, is quite an evil in our county. I think there are some Percheron mares in Essex, the intention being to breed a distinct horse. Mr. Walker and Mr. Rankin have each two or three fine mares of that breed, worth perhaps about \$1,000 each. For general purpose horses we use the Clydes, crossed on the native mares.

HORSE BREEDING PROFITABLE.

We are not selling many general purpose horses, but I think horse breeding is a profitable branch of business. I generally buy some colts and keep quite a number of young horses. A colt out of an ordinary mare, by an inferior stallion, whose services could be got for \$6, would be worth, at three years old, \$65 or \$70, whereas a colt from the same mare, by a thoroughbred Clyde stallion, would be worth \$100, and the cost of service would be \$10. We have no distinct breed of any cross in our county.

JOHN C. ILER

MR. McCAIN'S EVIDENCE.

WILLIAM McCAIN was called and examined.

To Mr. Dymond.—I live in the Township of Gosfield adjoining the lake shore, and am Warden of the County of Essex. I have 120 acres of land, of which I cultivate about sixty, the remainder being in bush and pasture. I grow oats, corn and all the grains usually cultivated in my part of the country. I keep a stock of cows for my own use. The soil is a sandy loam and heavy clay in our township. It is a heavy clay where I am living.

LANDS RECLAIMED BY DRAINAGE.

Some portions of our township have been reclaimed by drains. There is a great deal of low land that must be drained in order to be profitably farmed, and there is some marshy land which was worthless before it was drained. We have had a lot of bush land reclaimed. In fact nearly the whole township has been reclaimed in that way within the last ten or twelve years. The wet land was generally kept in bush before it was drained, the dryest land being selected for farming. The low places were worthless without drainage.

LARGE INCREASE IN VALUE.

A good deal of the land in the big marsh, in the centre of the township was sold for 50 cents per acre at one time, and now I consider it worth \$50 per acre. One man sold fifty acres, right in the middle of the marsh, with very little improvement on it, for \$2,200. I think the reclaimed marsh land is as good farming land as any in the township, because we get the virgin soil, and it is free from stumps. We have spent a large amount of money in drainage; I could not say how much.

Q. I should be glad to know the exact amount of land reclaimed in your township under the Municipal Drainage Act, and the additional value obtained for that land in

[*Mr. McCain.*]

consequence. A. Ten thousand acres, at an additional value of \$40 per acre, equal to an aggregate gain in value of \$400,000. One gentleman bought a lot for \$2.50 per acre, and now he is asking, and probably will get, \$9,000 for 200 acres.

CORN AND WHEAT CROPS.

The crops principally raised on this improved marsh land are corn and wheat. One man has 150 acres of fall wheat. A large quantity of corn is grown.

WHEAT GROWN ON SOD.

We generally turn over sod and put in corn and wheat. Good crops of both spring and fall wheat have been raised in that way. Sometimes the fire runs over the sod and burns it off, and then we sow it without ploughing at all.

CROPPING AWAY WITHOUT ROTATION.

We do not follow any rotation of crops; the land is so rich that we just keep cropping away and all get good crops. We have sown wheat after wheat.

THE RESULT.

I had one piece of sod which I turned up and sowed in wheat, six years in succession. The first crop was a magnificent one, but the crops gradually became less. The reason I cropped it so often was just that it happened to be convenient. The highest crop that I got off it was about thirty bushels to the acre, but there was one year when I would have had about fifty bushels had not a storm thrown it down. I only got eighteen bushels to the acre that year. The last year I got fifteen or twenty bushels an acre.

FARMERS ALIVE TO THEIR TRUE INTEREST.

There are not many who are cropping their lands in that way. Generally speaking, farmers are becoming alive to the necessity of keeping up the soil, as they find that their land is deteriorating. The system which they are now generally adopting is turning over clover. We generally cut two crops of clover, the first for hay, and the second for seed. Then we turn it over and generally sow wheat. Clover sod does not answer very well with us for corn. Turning over the clover sod enriches the soil and makes the clay loose. It also improves the sub-soil, as the clover draws its nutriment from below the surface soil.

CORN PLANTING.

A great deal of corn is planted on clover sod, and we put it in without reference to rotation at all. We generally pick the best ground for corn. I have a poor corn farm, and I have grown about sixty bushels of shelled corn to the acre. Fifty bushels per acre would be about the average for the township.

CORN STALKS AS FEED.

The straw is very good for feeding purposes. If the stalks are cut and mixed up with bran and middlings, it makes splendid food for dairy or fattening purposes, or for horses. The stalks are too rank for cattle to eat by themselves, and they are apt to dry out.

To the Chairman.—Even when they are dried out and bleached there is still nourishment in them. The stalks are worth from \$3 to \$5 per acre for fodder, which would make the corn crop worth about \$30 per acre on the average.

[*Mr. McCain.*]

CULTIVATING CORN.

To keep the ground in proper condition and secure a good crop, corn should be cultivated every week. My system of planting is much the same as Mr. Elliott's. We never use a hoe. We can kill the weeds perfectly well with the kind of cultivators we have. The cost of the ploughs we use is about \$5; the iron ones cost \$6. We raise our own seed corn, selecting the best ears when storing it after being husked. We pick out those that are well filled out to the end. We use the American Dent corn.

THE OAT CROP.

We generally follow a corn crop with oats, which are a successful crop with us. The usual yield of oats is about forty bushels per acre. The Poland and the Black oat are the varieties that are mostly used. We raise more than are required for home consumption, and we consider it a good paying crop. The cultivation of oats is on the increase. We find that sowing wheat on oat or pea stubble is better than summer fallowing.

DRILL SOWING.

I use the drill in sowing, and it is becoming generally used in our locality. I noticed on my own farm this year that the wheat that I sowed in drills stood the winter better than a four-acre field that I sowed broadcast. Drill sowing also requires less seed.

COST OF A FALL WHEAT CROP.

I think the estimate made by Mr. Elliott, of the cost per acre of a fall wheat crop is too low, perhaps, because our land is heavier to work than the land in Colchester. The interest on capital or the rent would be \$3; the preparation of the land for the crop would be \$2.50; seed, \$1.50; drilling and harvesting, \$2; threshing, \$2.80; and taking it to market, \$1.00; making in all \$12.80 per acre. I have used some gypsum on timothy meadow. In my locality I think it should cost about \$13 to cultivate and reap one acre of wheat.

BURNING THE STRAW.

The straw is worth \$1 per load, though some people haul away the straw and burn it as they think that they can get all the manure out of the ashes in that way. They say that their land has been materially benefited by burning the straw. I have lived in Essex since 1835. I was in Australia four years, and I noticed that the Englishmen there burnt their stubble. I was a farmer for a short time in Australia.

PEAS NOT A PAYING CROP.

I find that peas are not a paying crop, and very few are sown in our district. They are not a paying crop even when the bugs leave them alone, they run so much to vine.

FEEDING CORN TO HOGS.

A great deal of our surplus corn is used in feeding hogs. We consider by feeding our corn to hogs that we are getting it into small shape, so that it is more convenient to handle. It is quite an item to market corn on account of its being so bulky. On a farm of 100 acres the average number of hogs is thirty or forty, for both fattening and stock purposes. The breeds are generally pretty well improved.

BREEDS OF HOGS.

We have some Polands, but the Berkshire seem to be the favourite breed. A cross between the Berkshire and Suffolk makes a very good animal.

[Mr. McCain.]

WASTE OF MANURE.

Farmers do not take any pains to utilize hog manure by mixing it with bedding or straw, though they know its value. If I have a field convenient to the house I generally put the hogs in it. Some people put them in pens and keep them confined, but no means are adopted to preserve the manure in the pens. It takes too much labour to bed hogs in straw for the purpose of making manure, and farmers do not try much to save it. I know that our practice is a careless one, but time will remedy it. I think bedding the hogs in straw and making a compost would be better than burning the straw. Hogs generally fatten best in a large field, but in the winter we generally let them shift for themselves around the straw stack, etc. We have places to shelter them, such as sheds, etc.

THE PORK MARKET.

We send our pork to Essex Centre, and the buyers come there from Montreal, London, Toronto and other places. I don't know what is its destination, but a small quantity is sold to the lumbermen.

IMPROVEMENT IN STOCK.

To the Chairman.—Stock has been improved in our neighbourhood by the use of thoroughbred bulls, generally Shorthorns.

CHEESE FACTORY NOT SUPPORTED.

We make our own butter, and have no creameries, but we have a cheese factory in the township. Farmers generally do not support the cheese factory, though for what reason I do not know, unless it is that they are not satisfied with the working of the factory. They think it is more profitable to make the cheese by hand; they do not make the cheese by hand now. The patrons get the cheese made at so much a pound. They used to divide the proceeds rateably, but they became dissatisfied with that system. The owners of the factory draw the milk themselves. I do not know how largely they are going into cheese making this year. The year I patronized the factory they made a considerable quantity of excellent cheese, and I received an average of about \$25 per cow during the milking season.

GOOD SECTION FOR DAIRYING.

Our butter is bought by store-keepers and pedlars. Our section of country is well adapted for dairy purposes. There has been no talk of establishing a creamery among us.

SHORTHORNS AND AYRSHIRES.

The Shorthorn is a good deal raised in our township, but the people are beginning to think that they can improve them by getting other breeds, and they are now inclined to the Ayrshire. We do not raise cattle for beef to any extent; I don't know whether the cross would improve the calves, but that does not make much odds, as we calculate upon getting \$1 per week, on the average for the calves. The Durhams are very tender and require a great deal of care, and if they don't get this care they don't amount to much. The Ayrshires are very hardy. We are crossing the grade Durhams with the Ayrshires, but we have not had any experience of the result yet. Last year I raised a bull calf from a cow which was half Durham, and a thoroughbred Ayrshire bull, and it was the best I ever raised. I am going to use it for breeding purposes. The Ayrshires are a hardier breed than the Durhams, in the way we raise our cattle.

[*Mr. McCain.*]

PASTURING CATTLE—WINTER FEED.

I pasture my cattle, and I never feed them any corn or other grain, though I give them hay and straw. Sometimes we give our milch cows bran or meal. We cut our corn stalks and either stack them or take them into the barn. I feed my cattle the stalks and they eat more or less of it, and the rest goes for manure. We generally stack them in the field and feed them there. Some use hand-cutters, and others use steam-cutters.

NO STABLES FOR CATTLE IN WINTER.

We do not stable our cattle in the winter time, except cows when they are giving milk. We have sheds, and there is plenty of straw.

THE BUSH.

My bush land is not on the farm on which I live. It has about the same class of timber upon it as that mentioned by Mr. Elliott, and my experience with regard to labour is about the same as his.

LABOUR—WAGES.

I hire pretty much all my labour by the day, and the rate paid is generally \$1, and in harvest \$1.50.

THE BLACK WALNUT.

The front part of our township was at one time heavily timbered with black walnut, but there is none of that wood in Gosfield at the present time, and there has been no attempt to replant it or any other timber.

WM. MCCAIN.

MR. JAS. MACFARLANE'S EVIDENCE.

JAMES MACFARLANE, Reeve of Dover, County of Kent, was called and examined.

To Mr. Dymond.—I am farming 400 acres of land, which was all uncleared, heavy timbered bush when I bought it in 1853.

PRESERVATION OF TIMBER.

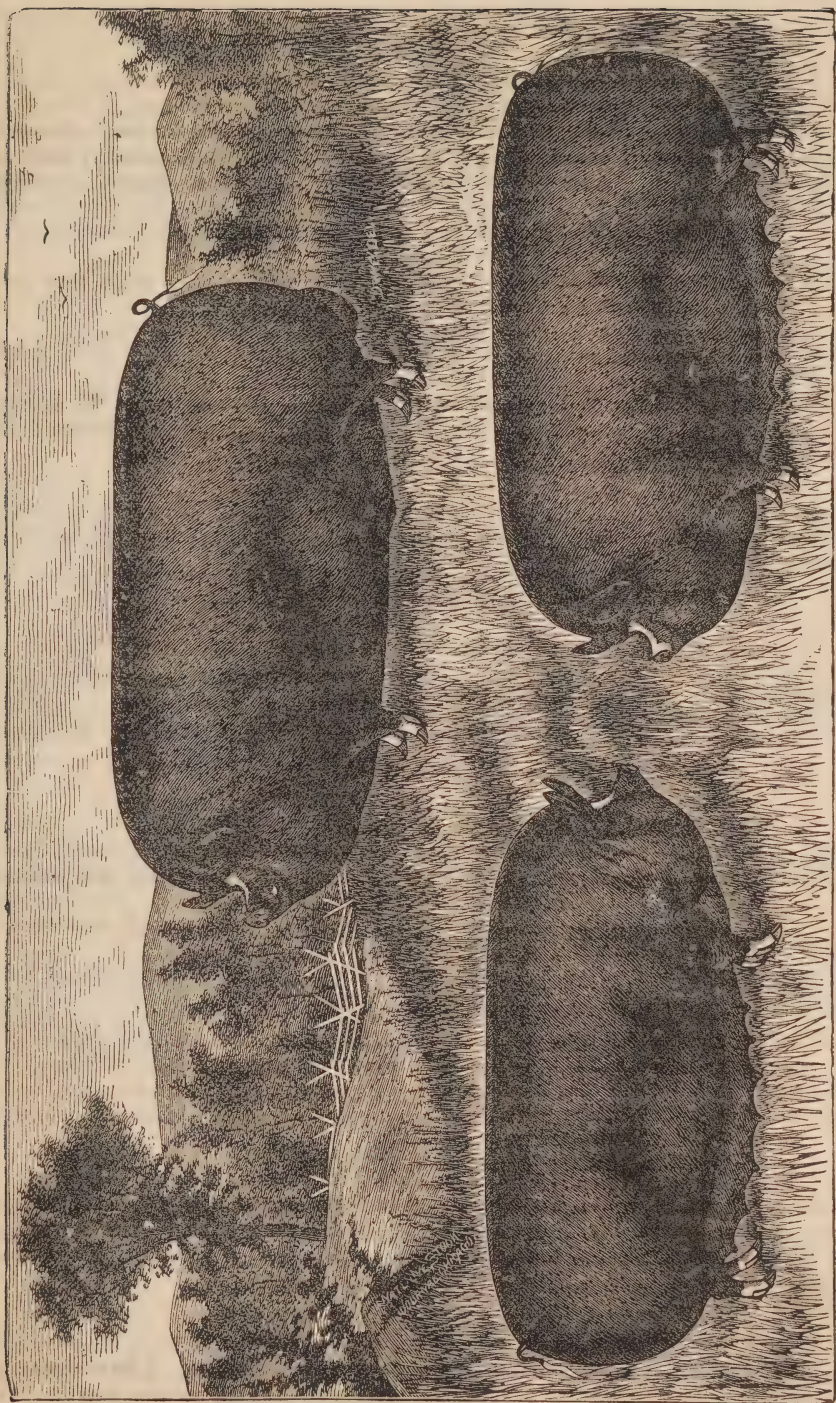
I have systematically kept standing the timber on the north and west sides of my farm purposely to shelter my fall wheat in winter and early spring. I have found this arrangement so beneficial that I intend to continue to preserve the young timber in belts on the north and west sides. My neighbours have not generally followed this method.

EFFECTS OF CLEARING ON FALL WHEAT.

My principal crop is fall wheat, and the first crop on the new land was 33 bushels per acre, but the yield is not always as high as that. I have occupied the farm continuously since the spring of 1863, and nearly all of my cleared land is now free of stumps. All the income from the farm is devoted to its improvement.

MANURES—GYPSUM—SALT.

I have scarcely used any manure except barn-yard manure. I have found plaster (gypsum) beneficial on grass for hay, but do not regularly use it, because it is not generally
[Mr Macfarlane.]



BERKSHIRES—PROPERTY OF JOHN SNELL'S SONS, EDMONTON, ONT.

cept for sale at a convenient distance. One of my neighbours regularly uses salt on his all wheat, and, he thinks, with great advantage.

CROPPING—PASTURES.

I have yet been unable to follow any rotation in cropping. A large part of my clearing has always been in pasture, and what has been in crop has not deteriorated. Like nearly all the lots in Dover, part of my land was not naturally dry. I was among the first in Dover to try to get the benefit of the drainage under the Municipal Act, but have found the benefit to be far less than the cost so far.

JAMES MACFARLANE.

ADDITIONAL.

I derive much benefit in the way of pasture, and great convenience otherwise from having, for some years, all my land within fence.

AVERAGE YIELD OF FALL WHEAT.

My fall wheat, 1880, averaged 26 bushels to the acre, excluding two to three acres entirely ruined by want of snow last winter. My spring crops, 1880, did not amount to one-third of a fair crop, owing to this very wet season, and to the fact that my efforts to secure drainage have been mostly frustrated by some unsuitableness, to cases like mine, still found in our drainage laws.

INDIAN CORN CROP—IMPROVED STOCK.

Some of my Indian corn reached a height of 11 feet this season. By always using males of improved kinds, I have succeeded well in getting better cattle, sheep, and pigs. Stock are liable to no peculiar disease in this township, and owing to our kind of soil and forest, running fires have never occurred hereabouts.

PORTABLE STEAM ENGINES.

Seventeen portable steam engines for threshing are owned by farmers and jobbers in Dover, all with attachments of the best construction. This shows the importance of our grain produce.

MORE DRAINAGE WORKS.

I am happy to say arrangements are now in fair progress for the early construction of a capacious catch-water drain at our easterly town line, to convey into the River Thames all the water-flow now poured upon the southern half of Dover from the township of Chatham. Naturally, Dover is the equal of the best part of the garden of Ontario.

J. M.

MR. T. L. PARDO'S EVIDENCE.

T. L. PARDO was called and examined.

To *Mr. Dymond*.—I am a farmer, was born and raised where I now live, and own a farm of 300 acres. I follow a course of mixed farming.

CROPS—CATTLE FOR EXPORT.

The soil in my locality being of a gravelly nature, is well adapted to the growth of winter wheat, Indian corn and clover, thereby enabling me to raise and fatten cattle for export.

[*Mr. Pardo.*]

GOOD CROPS OF WHEAT.

I had, the present year, 46 acres in wheat, which I have threshed and found to yield me 35½ bushels per acre, which is considered a good yield in my locality.

THE OATS CROP.

Oats are not up to the average with us this year. There is an abundance of straw, but the grain is light owing to the extreme warm weather of this season.

INDIAN CORN ALWAYS GOOD.

Indian corn promises to be an excellent crop this season, and, in fact, always does well with us, when the ground is in good order and properly tilled, frequently yielding 120 bushels of ears per acre. There is an immense quantity of corn grown in the counties of Kent and Essex, which is principally used for fattening hogs and cattle.

CATTLE RAISING AND FEEDING.

I keep about 30 head of horned cattle on my farm, consisting of milch cows and young stock under two years old. I also buy a number of two and three year old steers to stall feed in winter. The past winter I fed 24 head of steers, which I found to pay me well for my grain, besides the benefit which all farmers must derive from feeding all coarse grains, hay and straw, upon the farm, instead of teaming such away to market.

DURHAM GRADES.

My cattle are all grade Durhams from two to five crosses, and we always keep a pure bred Durham bull, which we change every two or three years, never letting him go to his own progeny.

CATTLE MANAGEMENT.

My mode of rearing calves is to let them run in a grass plot and turn them in with them night and morning for five or six months, then wean them by tying them up in a good warm stable during the winter, and feed with cut hay, adding a little meal bran, or roots, thereby keeping them thriving well the first winter, and turn to grass in good condition in spring, which is one great essential to all stock raisers. After running to grass the next season, they are again taken to winter quarters, which consists of a good warm yard, enclosed by high buildings on all sides, where they are allowed to run loose and fed with straw, corn stalks and clover hay, always having plenty of good spring water by them at all times. Although getting no grain, young stock cared for in this way will continue to thrive during winter almost equal to being on grass.

MARKETING STEERS.

I have sold steers, fed in this way, after they had turned two years, at \$50 each which had never been fed anything better than clover hay, except during the first winter.

CLOVER ON WHEAT LANDS.

I always sow clover on all wheat lands early in spring, which makes excellent pasture in the fall after the wheat has been cut. After cutting the first crop next season for hay, I plough the second crop under and sow wheat, which nearly always proves a good crop when sown after clover. In fact I consider it the very best fertilizer we have, and every farmer who sows clover largely must soon bring his farm up to a high state of cultivation.

T. L. PARDO

[Mr. Pardo.]

Sittings to take oral evidence, held at Toronto, August 3rd, 1880. *Present*—Mr. BROWN (Chairman), Hon. S. C. WOOD, and Mr. DYMOND.

MR. JOHN GIBSON'S EVIDENCE.

JOHN GIBSON, of Millikens, Township of Markham, was called and examined.

GRAIN FARMING IN YORK.

To Mr. Brown.—I commenced farming in this Province in 1847, just where I live now. My farm is a rich black soil, with a heavy clay sub-soil. I own 260 acres, of which I farm 160 acres. I have paid more attention to grain growing than to cattle raising for a considerable time, and I used to do a good deal in dairying and bringing butter to the Toronto market; but I have given that up. I keep just what stock I require for the ordinary purposes of the farm. I devote myself entirely to mixed farming, and specially to the rotation of crops and drainage. The subject of the rotation of crops is one of a pretty wide range. There are so many different kinds of soil and different circumstances, that what I might regard as almost perfection for myself, and carry out profitably, another, differently circumstanced and upon a different soil, might not be able to apply so profitably.

FIRST EXPERIENCE—PLANNING OUT.

When I first went upon my farm it was a rather peculiar one. It was wet, but not springy. There were no springs upon it, but it was full of frog ponds, and altogether a low, wet farm, not at all adapted for raising fall wheat. I made up my mind that I would make it a good farm if possible, fit for raising any kind of crop, although at that time it was almost in a state of nature, new and full of stumps. I commenced upon a hundred acres, and I laid out a plan, roughly indicating what I intended to do.

A SEVEN YEARS' ROTATION.

From 1847 to 1860 I was engaged in preparing the land for the rotation, and the rotation I decided upon was a seven years' rotation. (The witness here produced a plan of his farm, showing the location of the drains, and the rotation of crops which he had pursued to the present time.) There is one difficulty in the way of drainage—the difficulty of obtaining an outlet. I bought sixty acres in Scarboro', and for ten years it has been closed up because I have been unable to get an outlet through a neighbour's farm. If a law were placed on the statute book, enabling farmers to obtain an outlet for under-drainage, I think it would be a great benefit to the country. My farm, for the purposes of rotation, is divided into ten-acre fields. When I got the land into good condition for beginning the rotation, I commenced with a summer fallow, and it had a beneficial effect on every crop in the rotation. After the summer fallow came fall wheat; then barley; then three years of grass, seeded down; then peas; and then oats. There are two years included in the summer fallow. That is the system of rotation which I have carried out since 1860.

STATEMENTS OF ROTATION AND FINANCIAL RESULTS.

The following statements will show the expenditure on each crop of the rotation, the income derived therefrom, and the net profits, during the eight years of the rotation, on a ten-acre field:—

First and second years—Summer fallow and fall wheat.

EXPENDITURES—Ploughing five times, once with 3 horses	\$96 00
Harrowing, five times.....	13 00
Grubber, three times, once with four horses.....	11 00

[*Mr. Gibson.*]

Manure, 105 loads, at \$1 per load.....	\$105 00	
“ cost of drawing.....	18 00	
Spreading the manure.....	2 00	
Salt, five barrels.....	5 00	
Seed, 20 bushels, at \$1.25.....	25 00	
Sowing and working.....	2 00	
Harvesting, threshing, and marketing.....	50 00	
Rent for two years, at \$5 per acre.....	100 00	
Total expenditure.....		427 00
RECEIPTS—400 bushels of wheat, at \$1.25 per bushel..	500 00	
10 tons of straw, at \$3 per ton.....	30 00	
		530 00
Balance of profit.....		\$103 00

Third year—Barley

EXPENDITURES—Fall ploughing, six days.....	\$18 00	
Cultivating in the spring, and sowing.....	7 00	
Seed, 20 bushels, at 65 cents.....	13 00	
Harvesting and marketing.....	40 00	
Rent of land.....	50 00	
Total expenditure.....		128 00
RECEIPTS—450 bushels of barley, at 60 cents.....	270 00	
10 tons of straw, at \$2 per ton.....	20 00	
		290 00
Balance of profit.....		\$162 00

Fourth, fifth, and sixth years—Grass.

EXPENDITURES—Seed	\$7 00	
Harvesting, at \$1 per acre.....	30 00	
Marketing, three crops, 60 tons, at \$3 per ton....	180 00	
Rent of land.....	150 00	
Total expenditure		367 00
RECEIPTS—60 tons of hay, at \$11 per ton	660 00	
		660 00
Balance of profit.....		\$293 00

Seventh year—Peas.

EXPENDITURES—One ploughing	\$18 00	
Cultivation and sowing.....	7 00	
Seed, 20 bushels, at 80 cents.....	16 00	
Reaping and threshing.....	10 00	
Marketing	12 50	
Rent of land	50 00	
Total expenditure		113 50
RECEIPTS—250 bushels of peas, at 60 cents	150 00	
10 tons of pea straw, at \$4 per ton	40 00	
		190 00
Balance of profit.....		\$76 50

[Mr. Gibson.]

Eighth year—Oats.

EXPENDITURES—Preparation of land, including cultivation	\$25 00	
Seed, 25 bushels, at 42 cents per bushel	10 50	
Reaping and threshing	22 50	
Marketing	27 00	
Rent of land	50 00	
Total expenditure		135 00
RECEIPTS—750 bushels of oats, at 42 cents per bushel	315 00	
15 tons of oat straw, at \$4 per ton	60 00	
		375 00
Balance of profit		\$240 00

The following is a summary of the eight years' operations:—

	<i>Receipts.</i>	<i>Expenses.</i>	<i>Profits.</i>
First and second years—fallow and wheat	\$530 00	\$427 00	\$103 00
Third year—barley	290 00	128 00	162 00
Fourth, fifth, and sixth years—grass	660 00	367 00	293 00
Seventh year—peas	190 00	113 50	76 50
Eighth year—oats	375 00	135 00	240 00
Totals	\$2045 00	\$1170 50	\$874 50

That is a profit from ten acres in eight years of \$874.50, or \$10.93 per acre per year

IMPROVED CONDITION OF FARM.

When I charge \$5 for rent, I charge for a farm that is highly improved. Before I made the improvements on my farm, it was not worth more than \$3.00 per acre. The difference is represented chiefly by under-drainage. This rotation keeps the land perfectly clean and free from rubbish. That is one important fact in connection with this rotation, because we find a great many farms in this country overrun with thistles, and there is an Act upon the statute book to prevent their spreading; but this is a better means of getting rid of them than any statute. A thorough summer fallow, however, is the basis of the profit of the whole eight years of this rotation. The reason I have not put roots into this rotation is that they do not do so well upon my land as upon land that is of a lighter quality—say a sandy loam. I have always put in the pea crop where the root crop would otherwise be; but roots or peas may be used, which ever is the more suitable for the land. My rule is that if I find that I am going astray and I have a particular crop that does not pay me, I change it for something else; but I find that on the whole this has been a paying rotation.

ROOTS—PEAS—BARLEY—MANURE.

I tried roots, but did not find them profitable on the heavy clay soil of my farm. Owing to the failure recently of the pea crop, in consequence of the ravages of the bugs, I have been sowing two-rowed barley instead of peas, and I think that will pay me better; I have a surplus of manure amounting to about 30 loads which might be applied to growing roots. I obtain my manure just from the stock of the farm—pigs, sheep, cattle, and horses. Besides sowing salt on the fields, I keep it in the barn-yard, and scatter it around the stacks and about the barn-yard generally, and I think it is an excellent thing for manure. I am practically feeding salt to the cattle all the time. I think once in eight years is often enough to manure in the rotation I have followed, along with the ploughing in of the various crops. I always make it a rule to plough the summer fallow in the fall, so that it may get the frost in the winter, which makes it work easily in the spring. I plough the sod up in the spring for peas; it

[*Mr. Gibson.*]

seems to be fresher, and the peas can be covered in better. If I sow oats upon sod, I plough it in the fall, because it keeps solid and moist. All of the 160 acres of my cultivated farm are ploughed, except about 14 acres of bush. But I carry on this rotation on 100 acres.

CATTLE—BUILDINGS—PLASTER.

I keep, on the average, ten head of cattle, of which eight are milch cows, twenty or thirty sheep, six horses, and about a dozen pigs. That is the entire stock of the 100 acre farm. I have adopted no special system with regard to my farm buildings; there are two barns on this farm. With regard to the management of the farm-yard manure, I house most of my cattle, so that they make their manure in the barn-yard, and it is left there in an open heap. I have not as yet done anything to save the liquid manure. When the summer fallow is ready in June, I simply use the manure as it lies in the barn-yard, without any further preparation; I find that the rough, strong manure is the manure that suits my land best. I have not been using artificial manure to any extent. Some years ago I sowed plaster, but I never could see much advantage from it, and I do not think it is so well adapted to my land; it tends to harden clay land of that description.

USE OF SALT.

To Mr. Dymond.—Salt, I suppose, is only a stimulant, but I believe it promotes the ripening of the grain, and prevents rust. Year after year from twenty years ago, my fall wheat was often entirely destroyed with rust until I made the improvements which I have made on my farm; the consequence is that during the last ten years I have been very little troubled with rust in my fall wheat. I think the salt has had the effect of diminishing the rust, though not to such an extent as the under-drainage.

To Mr. Edward Stock.—I think salt is beneficial, even where land is not under-drained. I sowed it on spring wheat on the Scarboro farm, and I am able to tell, by the appearance of the grain, where the salt has been sown and where it has not; where the salt is sown, the grain is brighter and clearer, and the wheat riper than where it is not sown, and I am quite satisfied that since I have sown the salt on the fall wheat, it has a better and finer straw, and the grain comes to maturity more quickly.

To Mr. Dymond.—I give \$1.00 a barrel for the salt. I have put on about 140 pounds, or half a barrel, of salt to the acre.

SYSTEM OF DRAINING.

To Mr. Brown.—In originally laying out my drains, I did not go upon any principle as to distance apart; but I laid them out on a plan, so that I could see where they were, if anything went wrong with them. When I first began under-draining it was an experiment with me, and I had to draw my tiles fifteen miles. Before that, I had spent a great deal of labour and expense in surface-draining my farm, but some places were so hollowed out that it was almost impossible to drain them effectually in that way. When I commenced under-draining, I drew the tiles from Yorkville, fifteen miles. The average depth at which I put the tile drains was three feet; some of the main drains were as deep as four or five feet, and were cut through rising ground; but three feet was the average depth, except where it was necessary to have them deeper. On the surface of my land, about two feet and a half is a fine mixed clay soil, pretty easily dug, and below that is a marly, white, gravelly clay, very hard to dig. I had hardly any difficulty in the way of quicksands. When I first undertook to drain my farm, I bought "French on Farm Draining," for my guidance; but I found that the methods it proposed were too scientific and expensive for my purpose. I personally supervised the putting in of all the tiles, and put in some myself so as to be sure that the work was properly done. I levelled the drains with water; I carried water to some of them for that purpose, and levelled them from the top.

[*Mr. Gibson.*]

To Mr. Dymond.—I found that I did not require any tiles larger than three or four inches. In two or three of these fields there are nothing but two-inch tiles, and they do very well in some cases. There are two places where there are four-inch tiles, and there are a few inch-and-a-half tiles, which do very well where the land is not very wet, and where the surface is good. If I were putting in parallel drains, I would put them in about thirty feet apart; but in very wet places I would put them a little closer. A good many people just run the outlet of their drains to the surface; but I prefer to make a box of oak plank, and build it up with stone. Only one of my drains was put down without a bottom; it was one of the three-inch tiles—what was called a horse-shoe tile; and that was the only drain that I had occasion to lift. I would not recommend the horse-shoe tiles, as the water washes the earth away under it. I did not lay any timber under the tiles; it is not necessary on such hard land as my farm is composed of. I used to cover the joints of the tiles by putting a little straw on them, but I have found lately that it is not needed at all. I now just put the earth upon them.

COST OF DRAINING.

With regard to the cost of drainage, when I first put in my drains the cost was not so great as it would be now, because I could then get the best labour for 75 cents a day. The cost of draining the first of my ten-acre fields was as follows:

3½ days' labour, at 75 cents a day.....	\$22 87½
Board of men.....	8 00
2,400 feet of two-inch tiles.....	17 00
100 feet of one-inch tiles.....	1 30
Laying tiles, and filling, 5 cents a rod, for 155 rods.....	7 75
Hauling tiles.....	7 00

Total cost of draining 155 rods..... \$63 92½

That is about 41½ cents per rod, which was the actual cost of draining the particular field referred to.

To Mr. Edward Stock.—I used to be able to get drains dug and tiles put in for 10 or 11 cents per rod; but I could not get it done now for less than about 25 cents per rod. Some years ago, I think I got tiles for \$6, but since then I have paid \$7.

To Mr. Dymond.—I don't think I could have saved anything on the above expense by having the work done by contract, because labour at that time was low. I think about forty cents a rod would cover the cost of draining lands; but I find that the best and most profitable way is to have the tiles ready, and to use the farm hands in draining during the slack times.

THE OUTLAY REPAID.

To Mr. Brown.—I consider, on the whole, that the expense which I have laid out upon my farm is repaid to me in the diminution of the labour on the farm, the comfort of horses, the ease with which the fields are cultivated and prepared for the crops, and the saving of machinery. There is one remark that I would make for the benefit of those who have not had so much experience in draining as I have. Care should be taken to have one drain run along the headland, so that when the horses turn they will always turn dry. Another advantage of draining is that you are able to get the grain in earlier in the spring. I do not think that during the last ten years I have been later than the 20th of April in being able to sow, and I am much earlier in getting my grain sown than my neighbours whose lands are not drained, and there is also a considerable difference in the yield of the crop.

To Mr. Brown.—Before I drained my land it was hardly of any use for me to sow fall wheat in it. The highest average was from sixteen to twenty bushels to the acre, and when the midge came round a great many of my neighbours gave up growing fall wheat.

[*Mr. Gibson.*]

altogether. But after I had drained my farm I had almost always good crops of fall wheat, during the time that the midge was at the worst.

AN OUTLET REQUIRED.

To Mr. Dymond.—I find a great inconvenience in draining owing to the want of an outlet, in consequence of lands adjoining mine belonging to other persons. I think power should be given me to obtain an outlet through my neighbour's land, where the water is blocked on account of the want of drainage in his farm.

FARM ACCOUNTS—BUTTER—SHEEP.

To Mr. Brown.—I have been in the habit of keeping some account of the transactions of my farm. I have kept account of the receipts obtained for what I brought to market, but I have not kept account of the expenditure in detail. That would be a good deal of trouble, and as I found at the year's end that the balance was generally on the right side I became a little careless. I do not take stock annually. I have made it a business from the first not to run into debt for store goods, tradesmen's bills, etc., but to pay cash for everything, and I think that is one of the first elements of success for the young men of Canada. I have not done much in the way of keeping thoroughbred stock. I have always looked upon that as a business by itself. I have kept good grade stock chiefly for dairy purposes. At present we do not make much more butter than we use, but we formerly made on the average eight pounds of butter from each cow every week. I used to bring large quantities of butter into the Toronto market. I intend in the future to devote my cattle more to beef purposes than butter. The sheep I keep are Cotswolds and Leicesters mixed. I generally sell my ram lambs to the Toronto butchers. I keep all the ewe lambs. I intend to buy some stock this year and feed them. I think it pays better than raising them.

JOHN GIBSON.

Sitting to take oral evidence held at Galt, August 18th, 1880. *Present*—Messrs. W. BROWN (Chairman), and A. H. DYMOND.

MR. R. RENNELSON'S EVIDENCE.

RICHARD RENNELSON, of North Dumfries, was called and examined.

I have been on the farm I now occupy about eighteen years. I have lived on a farm all my life. The place that I farm now is a clay loam principally.

RETURNING TO FALLOWING.

I have abandoned fallowing altogether for some few years, but I find it will be necessary to return to it in order to keep down the thistles. I purpose attending to that matter by summer fallowing. I have not grown root crops to any extent for some three or four years. In my rotation I have not been very systematic in the order of the crops, further than that I have kept the land three years in grass. We keep both pure-bred Durhams, and some grade cattle. We have also three or four kinds of sheep.

OXFORD DOWNS—COTSWOLDS—LEICESTERS—SOUTH DOWNS.

We are now trying Oxford Downs. I have had a few of the Cotswold sheep for a number of years, also the Border Leicester and the Southdown. I give more attention to stock than to crops. I have been trying to get the land into a high state of fertility. I

[*Mr. Rennelson.*]

do not think it was in particular need of that treatment, still I wished to raise the fertility of the soil, and I have tried to keep it in grass as much as possible and plough that into land as much as I could.

SHEEP AND STOCK FARMING.

Sheep are the principal stock I keep, though I pay considerable attention to the breeding and feeding of cattle. Some of my cattle and sheep are fed on pasture alone during summer; with others I have tried the soiling system, feeding bran, meal, green corn and grasses in their season. My cattle do very well on pasture alone if we have moisture enough.

THE VARIOUS BREEDS OF SHEEP.

I find the most first-class sheep amongst the Southdowns. I have not gone into figures as to the profit. It would be difficult for me to say that there is any great difference in returns from the three different breeds of sheep. I have always used the best rams obtainable. If I have not had good enough ones myself I have gone to the model farm or somewhere else for them.

DEMAND FOR SOUTHDOWNS

This last year the demand for Southdowns was very large. I sold all I could spare at the first Show. I attended that, being in Guelph; and I cannot supply the present demand for Southdown ewes and rams. I have not sold at large prices. I have received from \$15 to \$50 for rams; from \$30 to \$50 per pair for ewes. My principal market for those is just in our own Province, though my principal sales last year went to Nova Scotia and Prince Edward Island. There is very little demand for Cotswolds in the neighbourhood of Galt.

SOUTHDOWN AND COTSWOLD BUYERS FROM THE STATES.

The buyers of them generally come from the States, and a great many of the American buyers prefer Cotswolds. I think there is a fair profit in turning out Southdown shearing rams at \$25 a head. My reason for turning my attention more particularly to the Southdown lately is that there seems to be a growing demand for that class of sheep. I think there is a tendency in the direction of a falling off in the demand for Cotswolds in the States. I have been assured by American buyers that there will shortly be a large demand in their country for Downs for the purpose of crossing on the long-wools they have been importing.

CROSSING SOUTHDOWNS AND LEICESTERS.

I have crossed Leicesters with the Southdowns, and the result has been excellent. By that course I have obtained a greater weight than in the Southdowns. I have thus obtained almost as heavy sheep as the Leicesters.

A BETTER CROSS WITH THE COTSWOLD.

I think, however, that the Southdown crosses better on the Cotswold than on the Leicester; this cross gives more wool, and I do not see but they are equally as good in other respects. The sheep are more apt to be bare of wool when the cross is with the Leicester; but by crossing with the Cotswold we get a larger sheep and more wool, about as much wool as from ordinary long-woolled sheep.

HEAVY SHEEP.

I have raised wethers over 300 pounds weight, and ewes weighing 270 and 276 pounds, but the demand for that class of sheep is somewhat limited. A lighter sheep is preferred for the European market.

[Mr. Rennelson.]

CROSSED—BREED WOOL.

The wool from half-breed sheep, if fine in texture, brings as high a price as that from pure Southdowns. We have been getting about 30 cents a pound for long wool; 40 was paid for Southdown this year in Galt. The demand for this wool is for home manufacture; we sell it to the manufacturer only. The wool produced by this cross is used, I presume, for hosiery work chiefly. I think it would be safe to say that sheep from a cross of the Southdown with the common ewe of the country would, with fair feeding, weigh 150 pounds at fifteen or sixteen months. The weight of the fleece might safely be called six pounds, clean wool. Perhaps under ordinary treatment the Border Leicester is unsurpassed as a mutton sheep, but for early maturing lambs for market I consider a cross of the Down much better, and for feeding to extra weights the Cotswold with his more angular frame, greater bone, and especially his superior muscle, superior to anything else.

USE OF GYPSUM.

I used gypsum for a number of years, but I have abandoned its use for three or four years. My experience was that it was highly beneficial to the crops which have been mentioned by the gentlemen here; but my opinion is that it is chiefly beneficial in a dry season, there being sufficient rain to dissolve the plaster in spring; in a wet season it is scarcely needed. I gave it up because my crops did not seem to require it, and it seemed to be doubtful if it had the same effect as previously. I suppose on account of the amount of gypsum there was in the soil it did not require it.

ASHES AND BONE DUST.

I have tried ashes with the best results, and bone dust, but not to any extent. I could not speak of the benefit of bone dust. I could not say that I noticed any particular benefit from it, but taking into account the usual quality of bones that are ground up, that is not to be wondered at.

USE OF SALT—AN EXPERIMENT.

I have used salt some three or four years. I have tried it on mostly all crops. In our barley field this season, there had been a crop of wheat the year previous. This field was ploughed in the fall by three horses—deep ploughed—and manured during the winter; about eight good waggon loads of manure to the acre were applied to it; and in the spring we sowed our salt before touching the land, about 200 pounds to the acre. This was harrowed and gang-ploughed in; but across the field, taking a fair average of the soil, I left unsalted a strip six yards wide. On about fifty yards length of this unsalted part, however, I put on the manure doubly thick, and when it came near harvest time the difference was very marked. Some of my neighbours saw the barley, and it was the universal opinion that the unsalted part would not yield more than one-half what the other did, partly because it was broken down and did not ripen. The part that received the double share of manure was much better, in fact nearly as good as the salted, but considerably broken down. I passed over the field yesterday, and the stubble on the salted part is quite bright, and you can see without difficulty, clear across the field, the difference between it and the stubble on the unsalted part, which is weak and dark. What was unsalted got the same amount of manure, except the part of it that got the double quantity. There is very little difference between the salted and the unsalted portions in respect of the clover catch, except that on the doubly manured part. It is decidedly best.

EFFECT OF THE SALT.

I have cut the crop. There is a decided difference in the head of the grain. The quality of the barley on the salted ground is decidedly better than that on the other—

[Mr. Rennelson.]

better filled and better coloured The straw was quite weak on the unsalted part, but it was the fly that was the cause in part of its breaking down. The fly seemed to seize on the unsalted part, while the other stood up. The salted part was also affected by the fly, but it stood up a week or two weeks longer than the unsalted. I tried a portion with double salting right across the field, crossing the unsalted strip at right angles, but I could not see any decided difference between it and the other.

TREATMENT OF MANURE.

I give my cattle salt, and use the manure from them. I try and pile my manure so that it can be rotted, and if it does not rot sufficiently to take it out in spring, I put a little horse manure among that which comes from the cattle to rot it.

EFFECTS OF GYPSUM.

I think gypsum has been used on the homestead farm as far back as I can remember. During the years that I used it I observed its effect on the land. I have observed strips of grass left unsown with gypsum, and it was yellow and sickly in appearance as compared with that on which it had been sown; it had not anything like the strength or dark green colour that the other had. Gypsum seems to have a cumulative tendency in the soil. Before I gave it up I used it chiefly on clover, on peas to some extent, and on turnips, and I took particular care to use it on the young grass. It seemed to help the brairding of the turnips, and they grew better. The effect was exactly the same on them as on grass.

HAY—BRAN—TURNIPS.

We generally have a great abundance of hay in the winter, and we buy a considerable amount of bran and middlings or whatever we think is useful for feeding. We find bran an excellent food. I am of opinion that turnips are cold for cattle unless they have thoroughly warm houses. I am in favour of them, but I can get along very well without them. I have not experimented in drainage to any extent, but I am satisfied our farm would be better for it.

PRIZES FOR FAT ANIMALS.

The feeding of fat cattle and sheep seems to absorb a good deal of interest in Canada, and I suppose it is of considerable importance that the regulations in connection with Agricultural Shows should be satisfactory. I have had considerable experience in feeding both, for exhibition, and I find generally that the prize is offered to the best fat animal or pair of fat animals. The question often arises, does this mean simply the fattest animals, or are there other qualities taken into consideration besides fatness? I have never found any director of an Agricultural Association who could give an official opinion on the matter; but the prevailing view appears to be that the "best fat animal" simply means "the fattest animal"—it may be an old cow weighing perhaps 1,500 pounds, or a prime bullock weighing 2,500; but if it is possible to say that the old cow is really the fattest animal, though the beef may not be worth nearly as much, she carries off the prize, and is thus declared to be the best fat animal, and the same with reference to sheep.

QUALITY AS WELL AS QUANTITY.

My impression is that quality and quantity should be taken into consideration as well as fatness, and that it would be a great deal more satisfactory if such matters were settled by societies instead of being left to the judges who on one occasion may give the prize to fatness only, and on another occasion take other qualities into consideration. I am now speaking of all shows. I am aware that males and females are often classed separately, but still the classification may have some force.

[Mr. Rennelson,]

 RULES AS TO THE SHEARING OF SHEEP.

Another thing that I would mention is the restriction as to the shearing of sheep. I think it would be better if this were removed, because I suppose all exhibitors of sheep know that it is not strictly adhered to. It is required that sheep shall be sheared after the 25th of April, and there is a considerable temptation to violate this regulation. Sometimes it is an actual benefit to sheep to shear them before that time if the wool is very heavy. Practically the rule is a dead letter, and I think it would be much better removed.

R. RENNELSON.

 MR. ANDREW ELLIOTT'S EVIDENCE.

ANDREW ELLIOTT, of North Dumfries, was called and examined.

CANADA THISTLE LEGISLATION.

To Mr. Dymond.—The Act against Canada thistles is not carried into effect about here. It seems to be a dead letter all over the part of the Province I am acquainted with. The thistle is the only weed that is of any particular trouble to us. There has been a weak sort of an attempt made to suppress the thistles. At one time we had commissioners appointed to look after them; but they made very few convictions. The pathmasters look after that now. I have not known of them making any convictions. Root crops do not exterminate the thistles, but they keep them down very much.

ROTATION—AVERAGE CROPS.

I attempt to follow a rotation. The great obstacle to following a correct rotation of crops is the uncertainty of the grass catching. Farmers ought to seed a great deal more to grass than they do, and with a greater variety of grasses. My average of fall wheat has been 23 bushels an acre for four years. Ours is said to be a good fall wheat country. One thing that has possibly helped our average is that for several years we raised hardly any fall wheat, and so the land was in good condition for it. I fancy my neighbours average about 23 bushels an acre. That pays for farming. [The witness was requested to prepare and put in an estimate of the cost and profit on raising fall wheat, which statement will be found at the foot of his evidence.]

AVERAGE BARLEY CROP.

When I was raising barley extensively I would average 35 bushels, but I have scarcely averaged 30 for the last four years. I have turned my attention more to fall wheat during that period. I changed the system of farming because we had been raising little wheat for some time, and we got some wheat that did well for us.

CROPS OF TURNIPS.

I feed all the clover and turnips. I estimate that we raise between 600 and 800 bushels of turnips to the acre.

SHEEP FARMING—SOUTHDOWNS.

I keep between 60 and 100 sheep, including lambs. I generally calculate to winter about 70 keeping sheep besides sheep that I feed. I am keeping Southdowns now. I [Mr. Andrew Elliott.]

used to have both Downs and Leicesters. I gave up the Leicesters. I think that the Downs are the best sheep for most purposes. They are a hardier sheep.

SHEEP FOR MARKET.

The object I have in raising sheep is to sell for mutton. Last year I sold my lambs in the beginning of December. They weighed 100 pounds then. In the winter I sold the sheep. They went away the 1st of April. They averaged 168 pounds. They were mixed, Leicester and Downs. I am not raising sheep for the express purpose of shipment to Europe.

DEMAND FOR SOUTHDOWN WOOL—CROSSES.

There is more demand for Southdown wool now than there was eight or ten years ago. The price of it is rising. The Down and the Leicester make a remarkably good sheep to cross; but the difficulty is to keep up your flock without breeding from the half-breeds.

A PROFITABLE BUSINESS.

Sheep raising is a very profitable part of my business. I got \$4 a piece for lambs last Christmas. The year before they averaged me \$8.60. They were lambs and old sheep mixed—draught ewes and the like of that. For shipping purposes the demand is principally for wethers.

DRAINING THE LAND.

I have done nothing to speak of in draining. Most of my land does not require it, it is mostly drained naturally. We have done some draining in the lower part of the farm.

USE OF SUPERPHOSPHATE.

Last year I was short of barn-yard manure, and I thought by using superphosphates on my turnips it would take the place of barn-yard manure. I accordingly applied Lamb's superphosphates—about 400 pounds to the acre—in connection with salt and plaster as usual, and left a strip up the middle of the field, and the turnips in this strip were not ready to thin for about three weeks after those had been thinned that had got the superphosphates; but before the crop was ready to harvest, those that had not got it were equally as good as those that had. They came on afterwards, and when the harvesting of the turnips came, about the 1st of November, those on which superphosphates had not been put were better than those on which it had. Those that did not get the superphosphates were later than the others, but the bulbs were sound, while on those that got the superphosphates the bulbs were not sound. I think that they had been rushed too much.

SUPERPHOSPHATES ON OTHER CROPS.

I tried superphosphates afterwards on potatoes, carrots and corn, and, with the exception of the corn, I do not think any benefit whatever resulted from the use of it. There are oats in the field this year, and I cannot say that the superphosphate has made any difference in them, but on the poorest side of the field I put a little farm-yard manure and I think the oats are double the crop, and the turnips were at least double the yield.

ANDREW ELLIOTT.

[Mr. Andrew Elliott.

ESTIMATE OF COST AND RETURNS OF FALL WHEAT CROP.

No. 1.

The following estimate of cost and income derived from wheat crop is taken from the crop of 1878, on a barley stubble—barley after clover :—

Rent of land (10 acres).....	\$50 00
Ploughing with three horses, six days.....	18 00
Harrowing twice over.....	2 50
Gang-ploughing, two days.....	5 00
Harrowing twice and sowing with drill.....	5 00
Plaster and salt applying.....	5 00
Reaping and binding.....	10 00
Threshing and marketing.....	20 00
Seed—13 bushels at \$1.25.....	16 25
	<hr/>
	\$131 75

The crop realized the following figures :—

Marketable grain, 330 bushels (an extra crop), sold for 95 cents....	\$313 50
Straw bedding.....	10 00
Chaff feed.....	5 00
	<hr/>
	\$328 50
Less cost.....	131 75
	<hr/>
Profit.....	\$196 75

No. 2.

The following is taken from the crop of 1879, from a yield which had been cut for hay for two years, an orchard grass sod, ploughed as soon after the hay was removed as possible, all before the 10th of July :—

Rent—14 acres at \$5 per acre.....	\$70 00
Ploughing—three horses, ten days.....	30 00
Harrowing and cross-harrowing.....	6 00
Gang ploughing, three days.....	7 50
Sowing and harrowing, three days.....	7 50
Seed, 21 bushels, at \$1.....	21 00
Reaping, binding, and hauling.....	32 00
Marketing and threshing.....	20 00
	<hr/>
Cost.....	\$194 00

Crop realizing, 330 bushels wheat, at \$1.20....	\$396 00
Straw and chaff.....	20 00
	<hr/>
	\$416 00
Less cost.....	194 00
	<hr/>
Profit.....	\$222 00

These estimates are made on the calculation that only one year's rent is chargeable as the land produced a crop the previous year, a summer fallow being thus avoided.

A. E.

[Mr. Andrew Elliott.]

Sittings to take oral evidence held at Perth, October 12th, 1880. *Present*—Messrs. EDWARD BYRNE (Chairman), and A. H. DYMOND.

MR. R. STEDMAN'S EVIDENCE.

Mr. REUBEN STEDMAN, of Drummond Township, County of Lanark, called and examined.

CHEESE AND BUTTER FACTORY.

I am engaged in mixed farming. I keep from ten to thirteen cows. I began cheese-making seven or eight years ago on the factory system. We bought the milk at that time, and continued to do so till last year. For about five years I made cheese only, and then, in 1878, butter and cheese. In 1879 I made butter only. For the past year the factory has not been in operation. I had collected the milk up to this time, and up to 1879 had bought the milk. In that year I manufactured on commission. As the patrons would not deliver the milk I dropped the manufacture for a time.

DAIRYING IN LANARK.

To the Chairman.—Dairying is pretty extensively carried on in my section. Farmers keep from eight to twenty cows, generally. There is no creamery except mine in the district. I had the patronage of three to four hundred cows. I think the tendency to go into dairying is increasing.

SEVERAL CHEESE FACTORIES.

There are several cheese-factories in the district, one every five or six miles. I think there are seven in an area of ten to fifteen miles.

COST OF MANUFACTURING.

The cost of manufacturing 100 pounds of cheese or butter is about 25 cents. Where patrons draw their own milk the charge is 15 cents per hundred pounds. Each cheese factory has from 200 to 300 patrons.

AVERAGE PER COW.

The average of cheese per cow is from 200 to 300 pounds; that represents about one and one-half tons of milk per cow. The cows are generally grades or common cattle.

BREEDS OF CATTLE.

The first imported cattle were Durhams, and then people went to Ayrshires. They do not use thoroughbred bulls, generally, in this section. The Drummond Agricultural Society has a thoroughbred Durham, and one or two are kept by private persons. So far as I know, the Durhams are exclusively used where thoroughbred males are employed. I have had some trouble in getting some of my best stock of grade Durhams to breed. Not many cows have suffered from prolapsus of the uterus.

WINTER TREATMENT.

I house my cattle in the winter. I think the use of stanchions for tying up is preferable to chains. I feed some chopped-stuff in spring.

[*Mr. Stedman.*]

SUMMER FEEDING.

The practice of summer feeding is increasing. The whey at the factories is returned to the farmers to feed to hogs and calves except where hogs are kept at the factories. I think the growth of green fodder has been very beneficial.

THE PASTURES.

We have no permanent pastures except rough, unploughed land. I have not the same opinion of pasturing some persons have. The manure does not appear to have any direct influence.

PROFITS OF FATTENING FOR MARKET.

I approve the use of the Durham, because, where the milking fails, the cow can be fattened for beefing purposes. I have never kept a close account, but I believe feeding for the market is as profitable as dairying. I can double the value of a beast by feeding for one season, and can do no more with a milch cow. I have not tested the value of different foods on the quantity of milk produced.

POINTS OF A GOOD DAIRY COW.

The points in a good dairy cow are, a heavy hind quarter, with a large milk vein, full udder, teats wide apart, with a clean, fine bone, small tail, fine coat, light on the front and neck, small horns, and short from the muzzle to the eye.

THE AYRSHIRES.

The Ayrshires are richer in milk, but there are some poor milkers among them, and for beefing they are very inferior.

DURHAMS—NATIVES—GALLOWAYS.

Many of the Durhams will give more milk than the Ayrshires, but it is not so rich. The best cows I ever had were Durham grades. Our old Canadian mixed breeds were excellent milkers. The Galloways are hardy and good for beefing, but not equal to good Durhams as milkers.

ADVANTAGES OF SOILING.

I think the soiling system may be managed as cheaply as pasturing. It will take three acres of indifferent land to pasture a cow, and one acre will feed a cow on the soiling principle. It will take two acres of good land. Take land at \$40 and it would not pay to graze it.

THE DISTRICT FAVOURABLE FOR DAIRYING.

I regard this section as well fitted for dairying. Pure water is abundant, and the pasturage is good. We turn the cows to grass from the 10th to 15th of May, or even earlier. I think the change from hay to grass should be gradual. I give salt once a week.

MILK COWS.

I think salt assists the supply of milk. Milk cows should usually be dried up at the end of December, but I would be guided by the price of produce and the season.

[Mr. Stedman.]

CHEESE FACTORY TEAMS—CANS—RENNET.

In cheese making we hired teams by the ton or season. I have often paid \$2 per ton; the factory was not very well situated, and the cows were widely scattered. The cans used held thirty to thirty-two gallons. They were ventilated by a pipe in the lid. The milk was tested with a lactometer and also a glass tube. We always used Rennet, the Irish or Bavarian, or our own. For four years we used the old water heater, but latterly we used steam.

MANAGEMENT OF THE MILK.

In making butter we filled cans from the receiver. The cans are twenty inches deep, and nine in diameter. We set them in spring water at about forty-five degrees for from twenty-four to thirty-six hours. The milk was then skimmed. When the skimmed milk was used for cheese the cream was churned sweet. We do not get quite as much butter from sweet cream, perhaps one-third less, but the buttermilk is perfectly good for cheese, and better than the skimmed milk.

GILT-EDGED BUTTER.

For the best gilt-edged butter we set the cream in tin vessels and bring it to sixty degrees to ripen. At that it will sour. It is left till it thickens, perhaps twenty-four hours from the time it is skimmed; it is stirred occasionally. By the thickening process all the butter is got out of the cream. We used a little colouring occasionally—a preparation of annatto.

THE CHURNING.

The churning was done by steam. Our churn was six feet long by four feet in diameter. It took forty minutes to an hour to churn. The temperature was from sixty-one to sixty-three, according to the weather. Our churn was air-tight. We had to admit air occasionally. The butter was washed in the churn with spring water and salt. I would throw the best dairy salt over it when in a granulated state. We used Higgins' Eureka.

TREATMENT OF BUTTER.

We used to work a tub of butter at one time. Butter needs compression, not working like mortar. When it comes to be close in the grain, and shines like a new dollar it is worked enough. About one ounce of salt is used to a pound, a little more or less in warm or cold weather. We preferred tubs soaked in salt brine for twenty-four hours and covered with a cheese cloth.

GODERICH SALT.

I always preferred Goderich salt ground fine for covering up butter. It hardened better after it had been wetted. The English salt did not harden.

NO ICE TO BE USED.

I would use no ice on butter. Butter that has been iced will not stand heat so well afterwards. Ice may be used to regulate the temperature of the factory. Our cans were completely immersed in a running stream of spring water. Each held about twenty quarts. Where the cans were immersed the cream would rise in ten hours, while, if only set in the water, it would take twenty-four hours. Ice on the top of the water will help the cream.

[Mr. Stedman.]

CHEESE AND BUTTER EQUALLY PROFITABLE.

In my opinion cheese and butter will make about an equal profit; but then I regard the skimmed milk as far more useful for young stock than whey. Whey will not feed young stock.

SKIMMED MILK CHEESE.

To Mr. Dymond.—We manufactured skimmed cheese largely. I think it is as profitable as cream-milk cheese. I think most money can be made on this plan. We got about two to three cents less for the skimmed cheese than for the other.

THE FAIRLAMB SYSTEM.

We have not yet tested the Fairlamb system, but I think it would be more profitable, and fairer both to the farmer and the factory. The great advantage is the lessening of the cost of collection, and the retention of the milk, while sweet, for young stock on the farm.

FARM ACCOUNTS—FEEDING PROFITABLE.

I know no farmers in this section who keep accounts. I cannot give accurate statistics of my farming or feeding operations. I have found feeding profitable. In 1878 I bought a steer in March for \$24. He was coming three. He was straw-fed when I got him, and running in the barn-yard. I did not weigh him; he probably weighed 800 pounds or a little over. I put him up to feed about the 1st of April. I fed him on hay, and barley and oats, about a gallon three times a day, for two months or a little over. We had no roots. In the first or second week in June I sold him for \$52.50. He weighed a little over 1,000 pounds, at 5 cents a pound. The cost of feeding would be represented by about thirty bushels of feed, mostly refuse grain, at about 40 cents a bushel; say hay \$4, or not over \$16 altogether. Then I had the manure, and the feed was worthless for marketing. I can fatten grade Durham cows, farrow, in four weeks.

PLENTY OF EXERCISE NEEDED.

I think the soiling system should include plenty of exercise.

CANADIAN SALT—PREJUDICE.

I have used Canadian salt in our own dairy for butter-making. I have never heard any complaints of it. Lately the merchants have not kept Canadian salt. A prejudice was created against it. We used it one year in our factory for cheese, and no fault was found with it. It was a stronger salt, and had to be used more sparingly than English salt. I have used an ingredient by which butter can be cured without salt. It is, at present, a secret. Butter made with it kept its flavour under very adverse circumstances. Where the cream only is collected the farmer gets credit for the exact value of his products.

REUBEN STEDMAN

JOHN MOTHERWELL'S EVIDENCE.

JOHN MOTHERWELL, of the Township of Bathurst, called and examined.

I have resided sixty years in the district, and am Deputy Reeve of the Township. I carry on a mixed system of farming. I farm 127 acres, with 100 acres cleared.

[*Mr. Motherwell.*]

IMPROVING THE STOCK.

I have been trying to improve stock for twenty-five years, and lately have used some thoroughbred bulls. I tried Ayrshires first, and made some improvement. This was chiefly for milk.

DURHAMS AS MILKERS AND BEEFERS.

I now use Durhams. They give richer milk, if not so much of it, and can be used for beef more profitably. They are just as hardy and as easily kept as the Ayrshires. A Durham grade fit for the English market will sell for 5 cents per pound, and the scrub cattle only 3 cents.

GRADE BULLS USELESS.

I recommend all farmers to use a thoroughbred male animal. I have tried improving with grade bulls, and found it useless. I could hardly hold my own with them. There was no certainty as to the animal I would get. The Durhams I use are brought in by some of my neighbours. The farmers round me are following my practice in improving their stock. The first cross often gives a good animal for export.

TREATMENT OF STOCK.

I give young stock what they need to keep them growing—roots and good hay, but not straw. I have adopted the soiling system partially. It requires less pasture, and keeps the cattle in good condition. I grow the Western corn for green fodder. The green corn helps the milk, but does not put much flesh on.

SHEEP FARMING.

I keep a small flock of sheep. I bought several sheep and a Durham heifer at the Guelph Model Farm sale. My sheep are nearly pure Leicester, with some Cotswold in them. I am going to cross with the Southdown, to secure early maturity. I never have any disease among my cattle or sheep. The Leicesters make good sheep at two years. The fewer sheep in a flock the better. I think sheep pay better than cattle, but would prefer to keep both.

WINTERING SHEEP—FEEDING.

Sheep in the winter should be sheltered, but not kept too warm, and the lambs separated. I feed the sheep on hay, and give the lambs grain every day. They should have the run of the barn-yard.

MIXED VARIETIES OF WHEAT.

Some years ago I mixed several sorts of wheat—Club wheat, Red Fern and Fyfe in equal proportions, and it did well. I have kept up that system since. The best crop I ever got was 25 bushels per acre, taking the whole crop. Lately I have not got so much. This year it would not exceed 10 bushels to the acre.

A GOOD CROP OF OATS—SALT.

I threshed oats this year, and got over 60 bushels to the acre. That land had salt applied to it. The crop that did not have salt was badly laid and was not of so good quality, although the land was richer and newly broken up. I used 300 pounds of salt to the acre, and 500 would be better. It stiffens the straw and helps to fill the grain. I have used salt with my grain crops for three years. It suits best on mucky land.

[Mr. Motherwell.]

GYPSUM—BARN-YARD MANURE.

I have used gypsum with marked effect on hay crops. I have not used other fertilizers. I manure freely with barn-yard manure. Leeched ashes are good on grass, potatoes and wheat. I never went into a calculation to see what raising any crop has cost me.

JOHN MOTHERWELL.

MR. PETER CLARK'S EVIDENCE.

PETER CLARK, of the Township of Montague, was called and examined.

I am a farmer, and Reeve of the Township of Montague, County of Lanark.

A 300-ACRE FARM.

I farm 325 acres of land, some 300 of which is cleared. I have resided in the township over fifty years. The fertility of the soil is depreciating through over-cropping.

THE WHEAT CROPS.

We sow a good deal of wheat and coarse grains. I grew spring wheat largely in former years. When we had good crops we raised from 20 to 25 bushels of spring wheat to the acre, and I have grown 40 bushels of fall wheat to the acre. For the last two years the spring wheat has been a failure, and fall wheat this year was winter-killed. We have been growing the Fyfe variety of spring wheat, and fall wheat known as "midge proof."

THE LOST NATION WHEAT.

I got four bushels of the "Lost Nation" wheat at the Model Farm last spring, and I think it will turn out 45 bushels, to (say) two acres sown. Fyfe wheat sown at the same time will not double the seed.

BARLEY—PEAS—RYE—OATS.

There is not much barley raised. Peas will give 40 bushels to the acre. We have no pea bug at present. Rye is grown, I think, profitably. It produces from 15 to 25 bushels to the acre. Oats I cultivate largely, and often get 50 bushels to the acre. We grow but few roots in our section. Buckwheat does well if not touched by frost.

ROTATION OF CROPS.

Our rotation is—from the sod : first oats, followed by peas ; then wheat on the pea stubble, with manure ; then seed down to grass again for about three years. We endeavour to pasture the grass meadows for a year or two before again ploughing.

FERTILIZERS—SUMMER FALLOW—MANURE—DRAINING—WEEDS.

We use no fertilizers, except barn-yard manure. We only summer fallow when necessary to clean up a foul piece of land, but shall have to begin it again. We have not many thistles, but some wild mustard. We have only under-drained in some low spots. I use wood for drains. I know of no tile being used in our section. I have made no calculation as to the cost of raising particular crops. We cut $1\frac{1}{2}$ tons to 2 tons of hay to the acre off our meadows. We grow some corn for both green food and grain. Corn always

[*Mr. Clark.*]

ripens with us; frost never hurts it. A good deal of our land is light or rough; about 200 acres can be ploughed. Flat rock comes into parts of it. My five sons work the farm without hired help.

THE STOCK OF THE FARM—YIELD OF MILK.

We keep in winter 40 or 50 head of cattle, of which 25 will probably be milk cows. We don't pretend to fatten stock. We look chiefly to dairying, and send all the milk to a cheese factory. Our cows will average \$25 apiece from the cheese factory, per season, and make butter besides. In addition to home consumption, we sell from 200 lbs. to 300 lbs. of butter. Dairying is more profitable than grain growing. The farm has improved under this system. We could hardly live on the farm previously.

UNIMPROVED STOCK.

The stock is not improved. We have used no thoroughbred male animal. I do not think there is a thoroughbred bull in the township of any breed. Our stock is as good as any I see in this district.

WINTER TREATMENT.

We house the cows in the winter; the others run in the barn-yard and sheds. We feed very few roots. We give the milk cows a little threshed grain about calving time. We feed hay in the stall, and the stock has the straw in the yard to run to.

SHEEP FARMING—SOUTHDOWNS.

We have 40 to 50 sheep every winter. They are common stock, crossed with the Southdown. I have a pure-bred Southdown ram. The improvement is marked since I used the ram. We get about five pounds of wool to the clip, taking the flock round. We send the sheep to the high rough land, and keep the cows on the better land. I have sold the sheep for shipment to England. I got \$7 apiece for three-year-old wethers. We always alter the ram lambs.

APPLE CULTURE.

We do pretty well in apples. Many of them are seedlings of our own raising. We find they do the best. They stand the climate best. They are mostly late sorts. Some are small, and these we grind to cider. Others are a fine class of apples, better than the grafted sorts for cooking purposes. We find a local market at 40 cents a bushel. We have raised a few pears only. We are troubled with the currant worm, and use hellebore successfully.

THE GRASSHOPPER.

The grasshoppers have been troublesome. They commenced three or four years ago, but now seem to be diminishing. They destroyed some fields of oats, about three years ago. They eat up the pastures first. They were the red-legged, winged grasshoppers. A little parasite destroyed large numbers.

AGRICULTURAL MACHINERY—BREEDING COWS—HOGS.

The farmers all use agricultural machinery freely. Very few farmers keep accounts. The whey is returned from the factory and fed to hogs. I have had milk cows often for fifteen or sixteen years. They never miss calving, nor are we troubled with abortion among the cows. Our hogs are the Berkshire breed.

PETER CLARK.

[Mr. Clark.]

Sittings to take oral evidence, held at Almonte, October 13th, 1880. *Present*—Messrs. E. BYRNE (Chairman) and DYMOND.

MR. JAMES BLACK'S EVIDENCE.

JAMES BLACK, of the Township of Ramsay, was called and examined.

GENERAL FARMING.

I have been a resident of the township of Ramsay fifty-nine years. I farm 100 acres, all cleared.

GRAIN CROPPING.

I devote my attention principally to grain-cropping. I chiefly grow spring wheat, oats—no barley—peas, and a little corn. The year before last I sowed some rye.

FAILURE OF SPRING WHEAT.

The two last years the Fyfe wheat has been a failure. The yield would not be over 10 bushels to the acre. I had previously averaged 30 bushels to the acre, and I have harvested 40 bushels. The last two years it was light, thinned out, and short in the straw. The soil was not impoverished. Last year I attributed the failure to the dry weather. This year the rust was the chief cause of trouble. I have hitherto used no fertilizers to remedy the mischief. The decline was not marked till the time I mention, or at all events, till the last three or four years. I had always used the Fyfe wheat.

BETTER RESULTS FROM NEW VARIETIES.

I have sowed some White Sea wheat also the last two or three years. That has done better than the Fyfe. The yield, I think, was 20 bushels of the White Sea wheat. I have also used the Emporium, a wheat similar to the Red Fern. That yielded about 15 bushels to the acre. The failure, in our neighbourhood, of the Fyfe wheat was general. Other farmers have tried other kinds of wheat. I have not tried the "Lost Nation." My farm is a rich clay loam soil, with a clay subsoil. I consider it a favorable soil for the growth of wheat.

FALL WHEAT CULTIVATION—WANT OF PROTECTION.

Originally I grew fall wheat till the country got open. I used to raise from 30 to 35 bushels to the acre, and have raised 40 bushels. I ceased growing it because it was winter-killed. I tried it again about two years ago. Some $5\frac{1}{2}$ acres yielded 40 bushels to the acre. Last year it was again winter-killed. I have no bush to the north or west of my farm to protect the wheat. I attribute the failure of the fall wheat in our section to the absence of protection. Where any has been saved it has been in some sheltered corner. The fall wheat when I grew it formerly was retarded by the seasons and want of protection, and the weevil and other enemies got into it. This was seventeen or eighteen years ago. My land is mostly flat and low.

RESULTS OF UNDER-DRAINING.

I have under-drained a good deal with tile, stone, and wood. I prefer tile. The effect of under-draining on the wheat, especially the Fyfe, was very good. I think draining is profitable. My farm was little good until it was drained. My success with wheat formerly was on the higher and dryer portions of the farm. The lower portions were entirely useless until they were under-drained. After draining the lower portions were the most profitable.

[*Mr. Black.*]

COST OF DRAINING.

Tile cost me formerly \$9 a thousand for three-inch, and \$6 for two-inch. They now cost \$12 for three-inch, and \$30 for five-inch.

COARSE GRAINS.

Oats are generally successful. I have raised 85 bushels to the acre, but I should put the average at 50 bushels. I grow the white oats. Peas are usually a good crop. This year I got 33 bushels to the acre. They have run from 25 to 40 bushels.

ROTATION OF CROPS.

My usual rotation is : peas on the sod, wheat on the pea land, then oats, and then I seed down with the oats to grass again for two, or perhaps three, years ; then pasture for one, or if we can, for two years, before breaking up. I manure as liberally as I can before sowing to grass. This gives a seven years' rotation. I grow roots largely. My average of turnips would be 700 bushels to the acre. I keep eighteen to twenty head of cattle over the winter, and about the same number of sheep.

IMPROVED STOCK.

I sometimes use a thoroughbred bull, either Durham or Ayrshire, and for sheep, a Leicester ram. I think the Southdown made the best first-cross in the sheep. In cattle I like the Durham best. If anything goes wrong with the cows they can be turned into beef profitably. They give good rich milk, if not so much as the Ayrshires. The Durham grades are good milkers. Both breeds are healthy, and both require equal care in treatment. There has been no disease among the cattle for many years. The cows give no trouble as breeders, and seldom miss a season. I always use a thoroughbred if I can get one. There are four or five thoroughbred bulls in the township. Their services are always available. I have never calculated the cost of raising any crop.

DAIRY FARMING.

I sent my milk to the factory for four or five years, but the price was so low the factory was closed. I sold some of the cows, and others did the same. We now make butter at home. I use what I understand to be Canadian salt for butter-making.

FRUIT-GROWING

I have spent a good deal of money in trying to grow apples. The trees failed. They were from Rochester, Kingston, and Hamilton. Some crabs (the Transcendental), from Hamilton, have succeeded. I have now got some apple trees from Arnprior. Out of ten, two are dead, and the others are not too growthy, but I think will live. The wild plum does well. The soil where I grow them is under-drained ; the trees are unprotected. I took particular pains with the trees from the first.

PEA BUG—POTATO BEETLE—GRASSHOPPERS.

We have not yet been troubled with the pea bug. The potato bug is less troublesome than formerly. On the high lands in our section the grasshoppers have been troublesome. Apple trees have been cultivated successfully in some sections of the township on the higher and lighter land. Wheat is grown successfully there too, and the sample is superior to mine. The soil there is a sandy loam.

RYE CULTURE.

I had a fine crop of rye two years ago. I regard the crop as more exhausting than others, although rye will often grow where other crops fail. The grasshoppers did not destroy the rye crop as it was too early for them. A good deal is grown in the township.

JAMES BLACK.

Mr. Black.]

ANDREW COCHRAN'S EVIDENCE.

ANDREW COCHRAN, of the Township of Ramsay, was called and examined.

I farm 200 acres besides bush land.

GRAIN GROWING—FALL WHEAT.

I give my attention chiefly to grain growing. I grow all kinds of grain except rye and buckwheat. Since 1837 I have grown fall wheat every year but one. The White Flint or Hutchison has answered best. While the bush to the north and west was standing, my crop of fall wheat was uniformly successful. Where other persons' crops were exposed the wheat was injured to some extent. I have raised from 10 to 66 bushels on an acre. The 66 bushels was on one particular acre. The field, $7\frac{1}{2}$ acres, averaged $48\frac{1}{2}$ bushels to the acre. The soil of my farm is a rich clay loam with clay subsoil.

EFFECT OF BUSH DESTRUCTION.

I had left the bush to the north and west the whole length of the lot an acre wide, but a strip four acres long was burned recently, and it has rendered 100 acres much less productive. The fall wheat blows bare and freezes out. I sowed nine acres last year and got just four stooks. I invariably lose the crop when I sow opposite the burned opening.

SPRING WHEAT CULTIVATION.

I have grown spring wheat successfully till the past two or three years. I have raised $42\frac{1}{2}$ bushels to the acre on one field, but about 30 bushels has been the average. During the past two or three years, of the Scotch wheat I have not got over 5 bushels to the acre, the Emporium would run this year about 15 bushels. I never saw wheat look better than the spring wheat for some weeks, when it gradually rusted and died off. I propose to re-sow the Emporium and the Scotch too.

USE OF FERTILIZERS.

I have tried phosphate but not with much result. I have used land plaster freely with peas, Indian corn, and clover. I sowed it broadcast on the crop at the rate of a barrel to two acres—that is about 150 pounds to the acre. The pea straw and pods were longer and the peas were plumper. I had used it on part of the field and the difference was material. Similar experiments were successful with Indian corn; it was stronger and taller. I cannot say as to the effect on the ear. The clover was taller and of a nice dark colour, and the crop was heavier. I have used leached ashes mixed with barn-yard manure with good effect. I have used the land plaster for twenty years and always successfully. I have used it on turnips very successfully for the braird; it came on strong and got ahead of the fly. I never missed a braird when I put it on.

OAT CROPS.

I have grown oats from 20 to 90 bushels to the acre; the average would be 45 to 50 bushels. I have ploughed the land well in the fall, cultivated and sowed in the spring, with good results. I attribute my large crop of oats to this system. We never sow with a tube drill. It takes $2\frac{1}{2}$ to 3 bushels, to the acre, of seed. I have never sat down to estimate the cost of raising any particular crop.

[*Mr. Cochran.*]

ROTATION OF CROPS.

As a rotation when I break up grass land I sow peas, then manure, and sow spring wheat; we either seed down with the wheat or follow the wheat with oats and seed down. We keep it in grass two to three years, and cut from 1 to 2 tons to the acre, say $1\frac{1}{2}$ to the average. We keep the land in pasture then for about three years. It then needs renewal.

TURNIPS—POTATOES—MANGOLDS.

I have grown from 600 to 1,000 bushels of turnips to the acre. I once got 1,000 bushels of potatoes off two acres. From 250 to 300 bushels would be the average yield. I never measured the mangolds, but they have done well. Of carrots I have raised at the rate of 1,200 bushels to the acre.

UNDER-DRAINING—SURFACE DRAINS.

I have under-drained a great deal. The first thing I do when I clear is to get rid of the surface water by open drains. The under drain does not work early in the spring because of the frost, and the surface drain relieves the soil of the water. I under-drain both with stone, wood, and tile. I make the drains $2\frac{1}{2}$ feet to 3 feet deep.

COST OF TILE DRAINING—WOOD DRAINS.

I like the tile best. The tile is not easily procured. We have to go near to Arnprior for it. It costs \$12 per thousand for 3 inch tile. The wood is cheapest. I put in a wood drain in 1852, and it is running yet. I never could have got such crops as I have mentioned but for the drains.

RYE CROPPING.

I do not grow rye. A large quantity is now grown, but a good deal was winter-killed last season.

ANDREW COCHRAN.

MR. ROBERT MACFARLANE'S EVIDENCE.

ROBERT MACFARLANE, of the Township of Ramsey, was called and examined.

I farm 360 acres of land in Ramsey, of which 225 are cleared.

DAIRY FARMING.

My attention is chiefly turned to dairy farming. I also grow a considerable amount of grain crops. I have generally been successful with wheat, but have grown less for ten years than formerly, as it was exhausting the soil.

FALL AND SPRING WHEAT.

I grow both fall and spring wheat. I have averaged almost 25 bushels to the acre of fall wheat, and 15 to 20 bushels of spring wheat, but this year both have been a failure, and last year I sowed no spring wheat. In that year the fall wheat did well, producing a full average. My farm contains a variety of soils; part is light sandy loam and part clay. I have grown wheat on both soils.

[Mr. Macfarlane.]

EFFECTS OF MANURE.

On the fall wheat last year in one field, I followed peas without manure, and in the other peas with manure. The difference was very marked, not less than eight bushels to the acre, in favour of the manured lot. We put twenty waggon loads of manure to the acre.

FALL WHEAT BLIGHTED.

I regard the failure of the fall wheat this year as due to a new blight. The wheat lost its colour early in the fall, before the winter set in, or any severe frost occurred. It never recovered, and did not grow. In the spring it was all gone. I could find no insect pest at work.

THE JOINT WORM AT WORK.

The spring wheat was attacked by the joint worm. It had looked well till then. I had salted the wheat land at the rate of two bushels to the acre. The spring wheat was partly Fyfe and partly what is called here China wheat. The Fyfe suffered most, but the China did not escape altogether. The fall wheat that perished, was partly Scott wheat, and partly White Flint. They both suffered equally.

SOWING FALL WHEAT—AN EXPERIMENT.

I have sown White Flint this year again, and purpose to cover part of the field with straw, as an experiment. I think in the event of sudden changes, it will prevent heaving by keeping the frost in the ground.

OATS—PEAS AS CATTLE FEED.

Of oats, I reckon 35 bushels to the acre, an average crop, but it has reached 60 bushels. Peas are a favourite crop with us, for three reasons: first, they do the soil good from the nature of the plant, drawing support largely from the atmosphere; secondly, I consider peas superior to any other coarse crop for feed or for market; thirdly, I consider the pea-straw, when well saved, equal to clover hay for sheep or horses. I count 25 bushels to the acre of peas, but have got 40. The crop never fails with me. I have had no pea bug or other enemy. I have a pea called the Mackintosh. We had other varieties that suffered from mildew, but this does not.

CORN CROP.

I grow corn for feed, not as a grain crop. I have cut this year seven tons to the acre, and have had more. The land was manured with the root crop a year ago. Last year I thought some corn, planted in the same field as the roots, and heavily manured with fresh manure, suffered more from drought, but this year the crop was a very fine one.

ROTATION OF CROPS.

My usual rotation is: first, on sod, peas; second, wheat or a root crop, manuring liberally; third, roots or oats, following wheat. If I follow wheat with oats, I seed down. I endeavour to seed down with every third crop. I never keep the land more than three years in hay, generally only two. I have grown from one to three tons of hay to the acre, according to the season. I always pasture for three years, sometimes four.

FALLOWS—ROOT CROPS.

When I summer fallow I sow buckwheat the year previous. It generally re-seeds itself, and I then plough it down. I do not believe in a naked summer fallow. I grow

[*Mr. Macfarlane.*]

mangolds and turnips largely. I count 400 bushels of turnips an average crop, and nearly the same of mangolds. I think root growing is perhaps exhaustive of the soil, but the manure makes up for it. I make a good deal of manure from stall feeding, and get a good deal from the town. I consider ploughing down a green crop is manuring. I have used both salt and land plaster. I have found land plaster a success with clover and peas, but not to affect other crops.

DAIRY FARMING.

I keep an average of 12 cows in milk, and about 20 head of cattle altogether. They are improved stock. Originally the Ayrshire was used to improve them, and more recently the Durham. The Ayrshires were too small. I count to get an average of eight quarts a day for ten months from each cow. We sell the milk chiefly and make butter of the rest. I reckon to make \$60 annually per cow, and could do more if we could sell all the milk.

MANAGEMENT OF COWS.

The cows are pasture fed in summer, but we add a supply of green food in the dry season. I feed in winter with hay in the morning, coarse straw at noon, and corn at night, watering twice a day. Morning and night I also feed meal and roots mixed together. I would give the turnips always after milking. We raise what heifer calves we can.

GRADES PREFERRED TO THOROUGHBREDS.

I prefer grades to thoroughbreds. I believe their milking qualities are equal, and their size is nearly equal for beefing, to the Durham. We consider the Durham cross equally as good for milk as the Ayrshires, and get the benefit in the carcass also.

FLOCK OF SHEEP—LEICESTERS—CROSSES.

I keep a flock of about 30 sheep or more, nearly pure Leicesters. The first improvement we made, over thirty years ago, was from the Southdown. No other cross did so well, but other breeds became popular, and the Southdown blood was got rid off. We had one Cotswold cross, which increased the clip, but it was coarser. We now use the Leicester.

HARDINESS OF THE SOUTHDOWN—HEAVY CLIP.

I never saw hardier sheep than the Southdown. I never saw a Southdown lamb suffer, even if dropped in snow. Six pounds is about our average clip. The first Southdown ram clipped 11 pounds washed. That was a very extraordinary clip from a Southdown sheep. A ram from that ram, crossed with our own, clipped 13 pounds. They were extra well fed.

EFFECT OF PROTECTION AND FEEDING ON THE CLIP.

I consider by careful and liberal feeding, and protection from the fall rains, the yield of wool may be doubled on any sheep. I had a Cotswold ram that once clipped 16 pounds. If I were not so near a town, and so could sell milk, I would go largely into sheep farming, as the best means of maintaining the fertility of a farm. This section is well adapted for sheep farming.

DOGS WORRYING SHEEP.

We suffer much from dogs worrying the sheep. I would offer a reward for every stray dog's head.

ROBERT L. MACFARLANE.

[*Mr. Macfarlane.*]

Sittings to take oral evidence, held at Toronto, June 22nd, 1880; Mr. DRYDEN, M.P.P., in the chair.

[The following evidence was given by Mr. Wiser, M.P., while under examination more particularly in relation to Horses and Horse Breeding; but it contains so much information of practical value in connection with general farm management that it is thought well to introduce it here.]

MR. WISER, M.P., ON FARM MANAGEMENT.

THE SHORTHORN MODEL.

To Mr. Dymond.—With reference to cattle, that which we want, in order to meet the demands of the English market, is an animal as nearly as possible to the thoroughbred Shorthorn. There is no other class worth talking about. There are other good cattle, such as the Polled Angus; but I don't think we could get the difference in price between the Polled Angus and the Durham to compensate for the difference in weight. There is no doubt the Polled Angus is much desired in England; but for the demand generally, the Shorthorn Durham is the thing.

DECLINE OF THE UNITED STATES AND RISE OF THE BRITISH DEMAND.

When I left off shipping cattle from the United States, I was getting 9 and 10 cents a pound for them, live weight. In Boston the very best cattle are worth only 5 or 5½ cents a pound now, while for the English market, buyers can pay 6 cents a pound, live weight, for them here, and ship them at a profit. The shippers are making money this year. Suppose we had to ship these cattle to the United States, and pay 20 per cent. duty on them, and then sell them there at 5 cents a pound, we would not have anything left. But when the American market failed, the English market stepped in, to the great advantage of the cattle growers and farmers of Canada.

THE POLLED ANGUS WORTHY OF EXPERIMENT.

If I were in the stock-raising business, I should try the Polled Angus as an experiment, because they perhaps bring a little higher price than the Durhams. A good shipping animal of this class weighs about 1,200 pounds; they are round and compact, so that very good cuts and roasts could be got from them. But to these things there is an offset in the mode of shipping, as it costs as much to ship an animal weighing 1,200 as one weighing 1,800 pounds, consequently you pay just 50 per cent. more freight on the lesser weight.

TOO MANY POOR CATTLE.

We ship too many poor cattle, because we cannot always get good cattle, and the result has been a great lessening of profits. First-class meat is what must be sent across the Atlantic to pay. I agree with Mr. Gibson on that subject.

PRIZES AT SHOWS.

To Mr. Malcolm.—I think the prizes given at exhibitions for the encouragement of Herefords, Devons, and such classes of cattle should be very small. We have to consider what class of cattle is the best for meat and milk combined, and what will sell best in the English market, and for these purposes there is nothing like the Durham. I think it is a waste of time to pay attention to anything else.

DURHAMS GOOD MILKERS.

I think there is a class of Durhams which are very good milkers. I just keep a few cows for my own use. Commencing with half or three-fourths Durham blood, I have bred

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them for twenty years to good thoroughbred bulls, and I have obtained cows giving me from forty to sixty-five pounds of milk a day. That, I think, is as much as has been got from Ayrshires or any other cows. I think a thoroughbred Durham bull crossed on our native cows will produce very good milkers, and by continuing to breed in that way, you will soon eliminate the common grades, and arrive at nothing but first-class stock. I would not pretend to go and select a bull that would produce good milkers, but I think, with a little attention, the best milking type could pretty soon be discovered.

FARM MANAGEMENT.

As I have a farm and endeavour to keep it in a high state of cultivation, it might be considered proper that I should give this Commission my mode of working a farm. In one particular I shall be pleased to do this, and it cannot help but be useful to show how an excessive amount of manure leads to the most abundant crops.

THE RYSDYK STOCK FARM.

I have a distillery and fatten annually over a thousand bees, and have an excess of manure to spread on the land yearly. In the spring of 1868 I bought the first concession of the farm that I have since turned into a breeding establishment for the produce of Hambletonian horses, the Rysdyk Stock Farm. It is situated on the River St. Lawrence, about 110 rods, or a third of a mile, from the town of Prescott, and about directly opposite the city of Ogdensburg, in the State of New York. It contains nearly 600 acres, and in front is crossed by the main road running from Prescott to Brockville. On the eastern side is a nine mile road.

BARNs AND STABLING.

On it I have two horse barns; one is a new brick building, and the other is built of stone. The brick barn faces the River St. Lawrence. The object in view in having it face in this way was to have benefit from the sun in winter, and to break off the winds from the north. It is 100 x 44 feet. There is a wing at either end running southward, each of which is 50 x 16, and the two wings enclose a court facing the sun which affords warmth for the young stock. About one-third of this space is covered with a continuous shed. Each of these L's or wings is divided into four separate box stalls, with doors facing courtwards, and with windows to the west and east. The main body of the building is divided into stalls, and contains an office, harness room, six box stalls, and sixteen open stalls. The six of the box stalls are 14 x 16, the open stalls are seven feet wide. The drive way through the barn is eighteen feet wide. There is an elevator running up through the centre of the building. The hay is kept up stairs in the loft. This barn is made of brick manufactured on the farm of Mr. N. Ward. The barn was erected at an expense of about \$6,000.

PLENTY OF GOOD WATER INDISPENSABLE.

I am very particular that stock should have plenty of water, and, to have it handy, had a well dug fifty feet deep in the court or southern side, and another one at the west end of the main building. The latter well is 100 feet deep, and both are sunk through the solid rock. The cost of boring in my section is about \$1.50 a foot.

CARE OF STALLIONS.

I demand extra caution in caring for the stallions on the farm, and especially so when teasing mares. In furtherance of this object I have had at each barn an appropriate œstrum made. The mare is enclosed in a small œstrum stall, and separated from the horse by a height of three feet and a half of movable planking, arranged so that it can be adjusted and removed at pleasure, and just sufficiently high to prevent the mare from kicking the stallion. This insures perfect safety to the male stock in ascertaining the mares œstrual heat.

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TEMPERATURE OF THE BRICK BARN.

There is no fire kept in this barn, except in the office, where one is lit occasionally ; nevertheless, with the thermometer at thirty degrees below zero, there has never been known to be a particle of ice on any water standing in the barn, in fact it never even chills. I think stock in this country, and in this climate, should be kept in stables where the water won't chill, in other words, that stock should have just as much warmth as we should have ourselves. I think one-half the grain will keep stock in better condition in this building than double the quantity would, running at large, or where the winds were whistling through. I think currying, grooming and cleanliness are equal to four quarts of oats a day. Although this is a brick barn, it is strapped and lined inside with matched lumber. There is a vacuum left between the lining and the brick of about an inch and a half. In my experience a building built in this way is the least conductive of cold and frost, and most comfortable. There is just one thing in favour of a stone barn—in an exceedingly hot day in summer, it is the coolest.

A. STONE BARN.

My other horse barn is a stone building that was formerly used for a wood-shed. The main building is 30 x 40, with a projection on the easterly side 30 x 20. The walls are twenty inches thick, and are strapped and lined with matched lumber inside with a similar vacuum of an inch and a half. In this there are eight box stalls. It is necessary to keep a coal fire in this barn in the winter, but, notwithstanding there is a stove kept in it, it is not so uniformly warm and comfortable as the brick barn without any heating apparatus in it. This I attribute to the fact that stone is a conductor, while brick is a less conductor, and especially so where there is a vacuum between the brick and the lining.

INTERIOR FITTINGS.

You want all the light and ventilation you can get ; the nearer you can come to nature, admitting sunlight, but keeping it from shining on your stock, the better. The doors to all the box stalls are so adjusted on moveable tracks that they roll backwards and forwards so as to occupy as little space as possible. There is a large open space in the door for light and ventilation, the space being grid-ironed with iron bars.

THE BOX STALLS.

Great care should be exercised in making box-stalls to have the edges of the upright sides of the place of entrance and exit rounded so that an animal will not be liable to strike his hip bones and injure himself, and that it be of sufficient height to prevent his striking the top with his head if he makes a sudden jerk back.

NO RACKS.

There is not a rack upon my premises where a horse is fed from a hay-loft down. The stock is all fed from off the floor, and all dust and hay-seed are kept from them as much as possible. My method of feeding grain has always been out of an iron box placed in one corner of the stall, adjusted about three feet six inches from the floor. The box is made with such an edge on the inside as will prevent a horse from rooting out his oats and scattering them over the floor. With such iron concave rimmed boxes, it is utterly impossible to throw oats out of the box in eating.

PROTECTION AGAINST MARES KICKING.

I am thoroughly particular with mares coming to my barns with the intention of using some one of my stallions, in having them securely fastened with couples, and for that
[*Mr. Wisser.*]

purpose I adjust a leather arrangement similar to a collar around the neck of the mare, and run two straps between her fore legs, buckling one to either hind ankle, and while this simple arrangement does not injure the mare in the slightest regard, it perfectly secures her from kicking, so that it is not possible for her to injure the stallion.

BREEDING ARRANGEMENTS.

In connection with this barn I have the œstrum on the outside. I find that I have to be particular in order to make it certain that mares get in foal, to watch them closely from the seventh to the ninth day after foaling, and unless they are served with the horse at least two or three times between the seventh and ninth day after foaling, I find that it is not certain that they will get in foal again. As a rule mares suckling colts through the summer are not so liable to get in foal as when they are not giving milk, and unless properly watched and attended to between the seventh and ninth day after foaling are liable to become barren. Mares under my care are tried regularly every week. I recommend that in serving a mare by a stallion these requisites should be observed to ensure celerity and cleanliness. When it is found that the mare is in her œstrual heat, plait the hairs of her tail firmly and compactly so as to occupy as little loose space as possible. At once after coition have the groom, who should have a bucket of tepid water and sponge in readiness, wash the male organs thoroughly and efficiently, and dry them well with appropriate toweling.

On the north eastern end of the stone barn is a covered enclosure 18x20, arranged to have plenty of air and free ventilation, which serves as a place to turn any of the stallions out in stormy weather to get exercise. Opening from this shed is a large door, three feet from the ground, directly connected with the œstrum before spoken of. This insures perfect safety for the stallion, and the mare cannot be injured even if she is not in heat.

EXERCISE FOR YOUNG COLTS.

My custom is to give young colts exercise when they are not in training, and for this purpose I have a number of paddocks made, inclosed with board fences $5\frac{1}{2}$ feet high, connected continuously with each other and the main drive ways, with gates. My custom has been in the fore part of the day when the sun is not excessively hot in the summer to turn my two and three year olds out there for exercise. In the heat of the day I put them up, and in the evening turn them out again, and when the nights are not severe I leave them out all night.

PASTURE IN SUMMER.

There is a portion of the time during the summer that I do not feed the animals not in training any grain. While the grass is good and succulent I don't approve of feeding them oats. There is a good well contiguous to the stone barn which affords abundance of water. I refer to this again to be expressive in my determination to have abundance of fresh wholesome water for my stock.

BLACKSMITHING ON THE FARM.

I find it a great source of profit to me where I have so many horses on my farm, and so many work horses to attend to, to do my own shoeing. I have a blacksmith shop on the farm and do all my own shoeing. If a shoe falls off it can be readily replaced at a very little expense, and for this purpose I have my own private blacksmith who works in the shop at necessary times, and at other times looks after my colts and broodmares.

BENEFICIAL EFFECTS OF MANURE.

To show to what an extent an excessive amount of manure will benefit land I have four small fields adjoining my paddocks that in the aggregate foot up twenty-eight acres
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and a third. I literally covered these fields with manure from the distillery in the winter of 1877-8, and the following season I cut one hundred and sixty-five tons seventeen hundred and some odd pounds of hay at a single cutting. The land was in average good condition when I put the manure on it, and had been in sod for two or three years previous. This was only top dressing.

SIX TONS OF HAY TO AN ACRE.

That year the hay was so abundant as to be difficult to cure on the ground. A quantity of this hay when dry had to be pitched on the load without any raking at all; the balance was cured by driving a tedder through it, and having very pleasant weather at the time, by turning it and using the tedder repeatedly, we succeeded in curing and getting it in, in very fine condition. So abundant was it, that much of the first growth lodged down and then there was yet another crop of grass grew up through this lodged grass. It was cut with a mowing machine, and besides the yield before spoken of there was a quantity that we were unable to cut. I invited some of our best farm neighbours, and drove them over the ground, and the residue wasn't placed by any of them at less than a half or a quarter of a ton left on each acre on the ground. In making up the aggregate of the yield of those 28 acres I concluded that there was a cutting of not less than six tons to the acre. This was arrived at by actual weighing, without any speculation or doubt about it, the hay being weighed when it was put in the barn, since which time I have had the ground accurately measured by a surveyor.

IMPORTANCE OF SHADE TREES.

I am strongly impressed with the importance of shade trees on my farm and for that purpose I set out over a thousand young maples at different times these last four or five years. I cannot say that I have had good success in always getting them to grow. I set them out invariably in the spring and it has been my experience that they do not always take root, probably not over half of them live. I am going to try horse chestnut in future. My present impressions are that I can make the horse chestnut grow. I am going to try them another spring, as I am led to believe that when planted and properly protected until the tree is of a certain growth, it will succeed.

A BRICK-YARD.

At the south-west corner of the Rysdyk Stock Farm, and within one hundred feet of a cove of the river St. Lawrence, I rent to N. Ward a brick-yard at a royalty of forty cents per thousand. It is bounded on the front by the main road and the St. Lawrence river, and on the west by a small stream running through the farm. The enbankment of clay so far has proved inexhaustible. This brick-yard has been in active operation over sixty years. I have questioned Mr. Ward in regard to the mode of manufacturing brick, and the quality of clay, and he gives me the following statement:

MODE OF MAKING BRICKS.

"I have had control and occupied the yard for twenty-one years this last spring, and supply the wants of all the surrounding neighbourhood with brick. There is about twelve feet of red clay on the top which I use for manufacturing red brick. Immediately below that is a very dark, blue clay from which white brick is made. I have bored down into this clay forty-two feet in endeavouring to open a well, and find the same kind of clay. In boring for the well I failed to find water, and come to the conclusion that the bed of clay is practically inexhaustible. I sell a great many bricks to United States citizens. My largest order at one time was to the United States Government, to which over a million of these brick have been sold. They were used in the custom house and post office at Ogdensburg."

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A BRICK MACHINE.

"I use a machine manufactured by Joseph Close, of Woodstock, Ont., which is capable of turning out twelve thousand bricks a day of ten hours. The clay is first put into the machine, and the horse does the pressing and hauling the moulds out, and then the bricks are piled into the hecks for the purpose of drying, and left there for about ten days, and from the heck they are hauled into the kiln. They are generally burned four days and five nights. I use wood of all kinds for fuel. The capacity of the yard is sufficiently large to make a million of bricks a year. I generally run from about seven to eight hundred thousand bricks a year. The quality of clay is first class and cannot be surpassed anywhere. The clay requires to be drawn out in winter and frozen. This is done so as to pulverize it." Besides being a brick maker Mr. Ward is a master builder and has been since 1850, and says, "brick made this way has lasting qualities and is equal to any brick that has ever been manufactured. There is just one process in making brick, the only difference being mostly in the machinery used. There is no difference in manufacturing except in the pressing. If the unburnt bricks get wet they are spoiled and fit for nothing."

THE BRICK-YARD.

Mr. Ward does not approve of a brick-yard being altogether covered. He is of the opinion that the sun must necessarily shine upon the brick in the process of drying; and the proper way to make brick is to give them all the wind and sun you can, simply covering the heck with enough boards to protect the brick from the rain. He never saw but one brick-yard that was completely covered up and that was a failure.

COST OF BRICKS.

He says, "I cannot supply red bricks here at less than \$5 per thousand. The white bricks which are manufactured under the pressing process, have been sold readily at \$14 per thousand, but a good white brick can be manufactured and sold for \$8 per thousand."

ADVICE AS TO BRICK BUILDINGS.

A word in regard to how brick should be used in building. He says:—"Take a three-story building, the wall in the first story should be 16 inches, the second story should be made 14 inches, and the top story 9 inches thick." Thinking the Commission would be pleased with something relating to clays, and soil for brick making, I purposely sent for Mr. Ward to explain as above and had a stenographer take down his ideas, even the expressions used by Mr. Ward.

CROPS OF OATS.

The only grain I had this last year was a forty-acre field. I had this field manured three years ago, and thus enriched that season's crop of grass, but I only cut $2\frac{1}{2}$ tons to the acre off it, which was so light that I broke it up and successively raised two crops of oats on the same ground. This field the first year yielded 2,244 bushels of oats off the green sward. Last fall it was ploughed over three times, cultivated, dragged, and ploughed again. This spring I had it ploughed, cultivated and dragged again, and sowed with oats, and seeded down. I had a yield this year of $74\frac{1}{2}$ bushels to the acre, and a little over four tons of straw to the acre, arrived at, not by approximation, but by actual measurement and weighing. This forty acre field is a light, sandy loam, faces the north, and has a slight declivity for drainage towards the gien and rivulet that diagonally cross the front concession.

OPERATION OF MANURE.

I have reflected in this manner as to this field: the distillery manure, although spread excessively thick on it, was fresh and not well rotted and fermented, which I think

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resulted in less yield the first season; the second season necessitated a term of decomposition to fully rot all the manure and upturned sod, and this year I had the full benefits of all my manure, and as it is now seeded I expect a bountiful crop of grass and hay from it yearly for the next five or six years. In seeding I used a mixture of four pecks of timothy seed and one peck of clover seed, and of this I distributed about one peck to the acre.

ARRANGEMENT OF THE FIELDS—FENCES.

My farm, which contains about 600 acres, runs back nearly to the end of the second concession, two miles and a half. The first concession is divided in the centre by a system of paddocks and board fences. The pasturage is connected, on the west side with a 72 feet lane from the rear to the glen, so as to admit stock at pleasure to water, and return them to the pasture. In connection with these paddocks I have another œstrum made for the trial of mares, with the same careful attention from danger as I have before described. I am very particular about my fences, to have them made of sufficient height to prevent any possibility of the stock getting out or others getting in. The board fences are 5½, and the rail fences 6 feet high. The worm rail fences are made of cedar with iron caps. The caps on which the rider rests are so arranged as to prevent the perpendicular stakes from separating.

STONE FENCES—GATES.

At the end of the first concession and about two-thirds of the distance of the same concession, directly across the farm, I have made two stone fences. First there are posts set in the ground, and the stone is built up to the post, so as to be four feet across at the bottom, and tapering gradually to three feet wide at the top, and from the stones upward I nail on the upright posts narrow boards and a top, making a total height of 6 feet. The other stone fence is 2½ feet high, 4 feet wide at the bottom and 3 at the top, with centre posts, boards, and likewise capped on top. For admission into the different compartments of my farm I am opposed to the old-fashioned way of posts and bars. I invariably use ordinary gates, attached to posts firmly sunk into the ground and fastened with padlocks, staples and hasps.

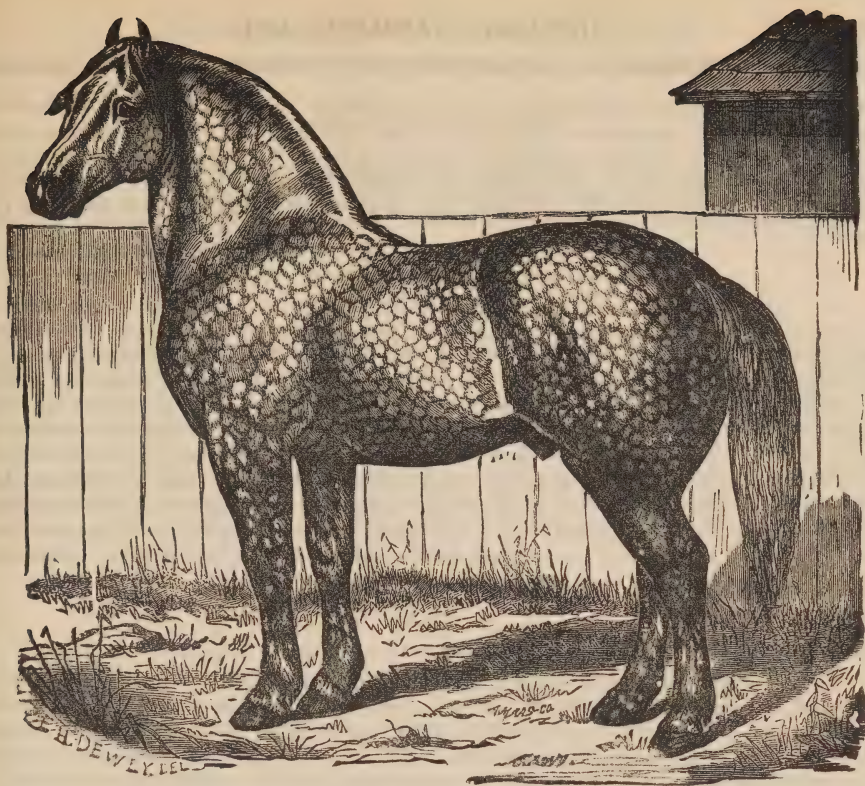
SALTING STOCK—WATER SUPPLY.

I think stock should have all the salt they desire within their immediate reach at all times. For that purpose I have in every field a long trough, and a man to see to it once a week that a sufficient supply of salt is kept in all the troughs. There is a never-failing stream running diagonally across the farm. To utilize it, there is a dam thrown across a small ravine, which makes a pond that is always kept full of clear, pure water, six or seven feet deep, in which the stock can go and stand and drink, and cool themselves. The pond is fifteen or twenty rods long and about fifty feet wide. The water is kept pure by allowing it to run out and over the dam as fast as it runs and oozes in.

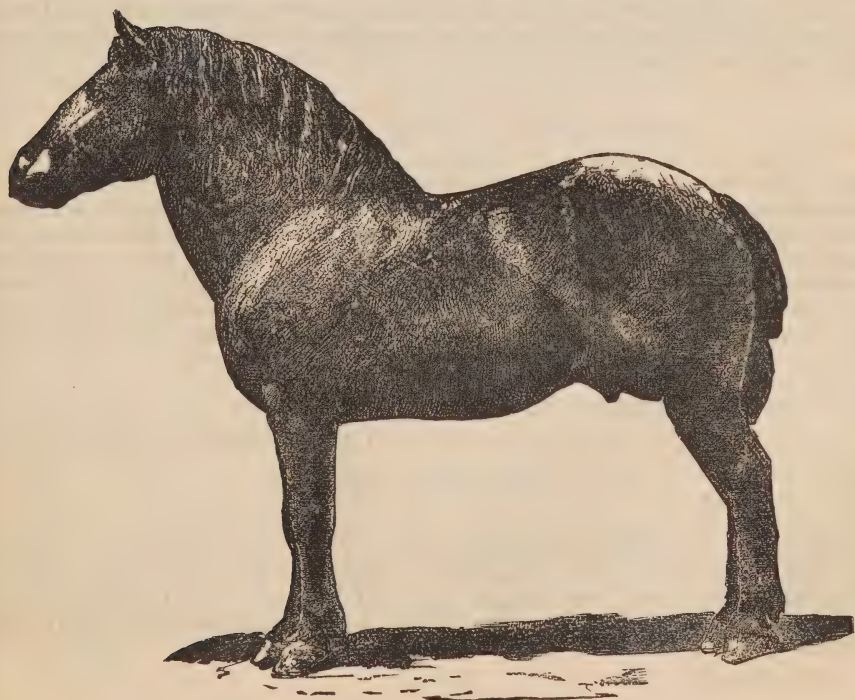
DIVISION OF STOCK.

I am particular in having all my stock divided in the different fields according to their age and sex. One field is for brood mares with their sucklings, one for the geldings, one for two-year olds, one for fillies, and one for mares that are sent to my stallions to be bred. There is one field alongside the nine-mile road that I use for geldings, which is deficient in running water, it not being practicable to make a lane from that field to the rivulet. In that field I have a well 26 feet deep, which furnishes an unfailing supply of water. I have it regularly pumped into large troughs. I have a windmill to put in there when I get to it. Sometimes this is used in the spring of the year for brood mares, and I have there the necessary paddock and safety œstrum that I have before described.

[*Mr. Wisser.*]



THE PERCHERON.



BELGIAN DRAUGHT HORSE.

IMPROVEMENT OF LAND.

When I purchased this farm it was so impoverished that it did not produce anything in comparison to its present yield. By the manure which has been put on the farm the 28 acres previously spoken of, would produce more than the original farm which was 333 acres, but has since been added to, until I have what is now enclosed.

BLUE GRASS.

I have a glen lot, as we call it, that has run into blue grass, that is just about as good a field of blue grass as is to be found anywhere. It will compare favourably with the blue grass of Bourbon County, Kentucky. Within the last year I have been twice to Kentucky and looked over the blue grass there, and I am satisfied that my fields can produce as good blue grass as they can there. I would say that, as a general thing, our land here is too dry for blue grass. A dry season has a tendency to kill it out. My experience is that where there is an excessive amount of manure used, the drought does not have the same effect. I get good grass off this farm in dry seasons, when farms that are poorly manured yield poor crops. I never fail now in obtaining good crops.

BURNING THE STUMPS—WEEDS.

There is one thing that farmers very much overdo, and that is setting fire to stumps in pasture fields. I would never burn stumps off my farm, but let them rot in the pastures, as the *debris* enriches the earth. In the meadows they have to be taken out of course. You ask if I am troubled with weeds on my farm, and if so, can I eradicate them, and how? When I purchased the farm it had been neglected very much in that particular. I commenced a thorough work of elimination, and when the Canada thistle and white daisy, or bull's eye, made their appearance I had men detailed on purpose to dig them up by the roots and carry them off and destroy them. This proved a work of great labour at first, but yearly it became less and less, and I have but few now, comparatively none at all. When a few do appear I follow the same plan. I can say I have by this means got them eradicated. I can make no headway against the mustard nuisance. The buttercup or mustard has beaten my every effort.

CAN WE COMPETE IN CATTLE AND HORSE RAISING.

Q. Have you come to any conclusion as to whether cattle and horses can be raised and produced cheaper and better in our climate and on our grasses, in comparison with that of a more southern soil and climate, or the contrary? A. I have given that subject a great deal of attention and thought. When I first began to buy cattle for feeding for beef purposes, I bought in Illinois, Indiana and Ohio, and drove them by easy stages all the way north to the St. Lawrence. I then bought good steers, well developed and thrifty, but they did not take on fat and grow from being stall fed as well as our class of stock. I bought them very cheap compared to what I pay now, but that was many years ago and times have changed greatly since. The markets now are very different. Then I had the advantage of the United States markets, and there was no British market available to us. I buy now altogether in Ontario.

QUALITY v. CHEAPNESS.

Upon the whole I think the Western States can raise a three-year-old steer, seemingly fat and fair, cheaper than we can. I think if our farmers would confine their cows to Durham sires they could produce a thirty months old steer that I would sooner have, and pay much more for, for my purpose, to feed, than those of the same age from the western ranches. They certainly can be raised much cheaper in Texas, Arkansas and Colorado

[*Mr. Wiser.*]

than with us, and thus sell cheaper, but in my opinion their meat is less substantial and marbled, and I conclude that we can raise them of much better quality but cannot raise them so cheaply. However, I know the Americans can lay down beef in the British market from the western prairies cheaper than we can with our mode of production, but our beef will always be better, have the first call in market, and demand higher figures.

FREIGHTS TO EUROPE.

Our greatest trouble now is cheap trans-Atlantic freight. If we had more steamship competition, and freight as low as American bottoms carry live stock, there would be a large profit for breeder, feeder and trader. Taking into consideration the size of beef stock mostly raised in Canada at present, I think if steamship companies would carry live stock by the ton instead of by the head, it would privilege us in exporting a much larger quantity of beef than we now do. It would not be as heavy beef probably, but it would enable our farmers to sell a smaller class of beef cattle and more of what they have to spare, even if they sold at less prices. Freight charges could be so adjusted as to be none the less profitable to steamship lines, and this would enable buyers to purchase equally as fat but a lighter class of bees—of which the supply is abundant.

ADVANTAGE FOR PRODUCING HORSES.

In regard to producing mature average priced horses, I think our soil and climate excel. Our seasons in Ontario are just what is required to mature and educate a good roadster. After weaning, the first winter of his coltage brings him all the time for his feed and care in contact with man, his future master. These surroundings tend to his docility and tameness. The next six months of summer give him the very best grazing and pasture, with a temperate atmosphere and plenty of palatable unstenched water for drink. Alternating with his freedom in summer, to his contact with his keeper in winter, the first three years of his life, if gently handled, make him docile, tractable, and free from vice. Our winter seasons of snow and ice make it a pleasure to break him to harness and labour, and give him his first lessons with but little fatigue and exertion to himself. My life-long experience has been that horses matured and brought up as is our custom in Ontario, make more docile, less vicious, harder, tougher, more endurable, and more valuable animals than those reared in a southern climate.

J. P. WISER.

Sitting to take oral evidence, held at Belleville, October 18th, 1880. *Present*—Messrs. AYLSWORTH (Chairman), and DYMOND.

MR. K. GRAHAM'S EVIDENCE.

KETCHAM GRAHAM, of the Township of Sidney, County of Hastings, was called and examined.

He said: —I farm 280 acres of land, of which 250 acres are suitable for using the reaper and mower upon. My farm is rather low, and the soil, is to a very great extent, alluvial deposit. The greater portion of the subsoil is a stiff clay.

PASTURE LAND.

I have no unbroken land, or original pasture, except thirty-five acres off which the timber has been cut for three years, when it was seeded down in timothy and clover. It is now in pasture. I have mowed it one year of the three. I think that by using fertilizers, and not pasturing too close, I could keep it in pasture for an indefinite period.

[*Mr. K. Graham.*]

DAIRYING AND BARLEY GROWING.

I keep about forty cows, and barley growing and dairying are my chief operations on the farm. I had 3,200 bushels of barley, and 1,000 bushels of fall wheat this year. I do not care to grow barley two years in succession on the same land, but sometimes I am forced to do so.

ROTATION OF CROPS.

My rotation is, as nearly as possible, as follows: I would break up sod and sow either peas or Indian corn, but the prevalence of the pea bug of late would oblige me to change this system. If the crop were peas I would gang-plough the land immediately after the crop is off, and plough it twice afterwards in the fall. In the spring I would either gang-plough it or cultivate it crosswise, putting in barley with a broadcast sower, and seeding down with twelve pounds of clover and ten of timothy to the acre. The reason I sow so much clover is that a close heavy crop makes the best hay. The third year I would take a crop of clover, and then if I had a good catch of timothy I would pasture it, but if not I would take a crop of clover seed—that would be the same year that I mowed the clover. Under all circumstances I would mow the first crop of the seeding down, and I would never pasture more than one year without breaking up. This is a five years' rotation, not including the sod.

BARLEY GROWING IN THE BAY OF QUINTE DISTRICT—PRICE—QUALITY.

Barley is grown very largely in my district, as it is the most profitable crop we can raise. The average yield is about forty bushels to the acre; and I think sixty cents per bushel for it—which I consider a low price—is quite equal to \$1 for wheat, and it is a safer crop. The barley grown in the Bay of Quinte District is the highest standard of barley for American maltsters' use.

SYSTEM OF CROPPING.

I do not think barley is anything like so exhaustive a crop as oats or wheat, and at the present time I am following my barley crop with fall wheat. My plan for the last three years has been to plough sod, take off a crop of corn or peas, then barley, plough the land three times, and sow it in fall wheat, seeding down with timothy in the fall and sowing clover the following spring.

EXEMPTION FROM CASUALTIES.

Barley never fails except in black muck land, when it may be attacked by the grub or wire worm, but even that is exceptional. During an experience of twenty-one years I have only found that the results of a spring wheat crop equals that of barley in two years.

BARN-YARD MANURE—PLASTER.

I trust chiefly to barn-yard manure, but, excepting the last two years, I have sown on an average, about eight tons of plaster a year. My faith in its benefits have however been rather shaken during the last two years. I have sown about three hundred pounds to the acre.

TOP DRESSING—SUMMER FALLOWING.

In the six years' rotation I used manure as a top dressing and ploughing the sod, but this last year I have departed from that plan. I have summer fallowed seventeen acres, the manure being ploughed under with fall wheat. The reason I have changed is because I believe I can grow fall wheat.

[Mr. K. Graham.]

ROTTEN, INSTEAD OF GREEN MANURE.

I used to manure on new sod. The average quantity applied was about twenty-five waggon loads to the acre. At present I am in favour of using rotten rather than green manure, as, in that way, I get rid of foul seeds, and also of such grubs as the wire worm, which seem to be produced by green manure.

MANAGEMENT OF MANURE.

I think it desirable to cover the manure with earth, if labour is not too dear. I generally draw it from the barn-yard to the field where we want to apply it, simply because it is less expensive. I do not keep any pit or reservoir for the liquid manure, but believe that it would be a good thing to do. I always try to use enough straw to absorb the liquid manure.

COST OF RAISING BARLEY—AVERAGE PRICE—YIELD.

I estimate the following as the cost of an acre of barley: Rent or interest on capital, \$4; one gang-ploughing, 40 cents; two other ploughings, \$2; harrowing, 50 cents; seed, \$1.20; cross cultivating, 30 cents; harrowing and rolling, 60 cents; harvesting, \$1.50; threshing, \$3; manure, \$2.50. The average price of barley is about 70 cents, and the yield forty bushels to the acre.

SPRING WHEAT—FAILURE OF THE CROP.

I have been sowing spring wheat every year until this last year. Seventeen years ago we could raise from thirty to forty bushels an acre, and last year we harvested only about eight bushels an acre off thirty acres of new land well summer fallowed. I first sowed the Fyfe and then I tried the Red Fern, but I do not think it was any improvement; I have also tried the White Russian, but it did not succeed. I have found the Fyfe the best of all the varieties I have tried.

DECLINE IN THE YIELD OF FALL WHEAT.

There has been a gradual decline in the yield of fall wheat. I have not grown any fall wheat for twenty years until the last two years. I gave it up twenty years ago on account of the weevil. Crops in my neighbourhood in 1879 yielded thirty bushels to the acre. This year I have forty-six acres, of which I have ploughed up six, and I expect to have 1,000 bushels from the remainder, though some of it is badly winter killed.

THE PEA BUG—GYPSUM.

The pea bug is getting to be a serious pest. The only plan we take to avoid it is to get our seed from the northern townships, where it is not so prevalent. The land plaster I used came from Oswego. Its good effects, of late, seem to be getting less and less every year, owing, I believe, to the deterioration of the plaster, as I have tried it on both old and new land. I have not tried any but the American plaster.

SALT AS A MANURE.

I have sown salt broadcast on grass and barley land, but I do not think that it has repaid me for the outlay, though the straw appears to be slightly stiffer, and the salt attracts the moisture.

[*Mr. K. Graham.*]

DAIRYING—THE FIRST CHEESE FACTORY.

I have been connected with the dairy business since 1866, and it is carried on largely in our district. After gaining all the information I could by visiting the dairy districts of America, I put up the first cheese factory in the County, in 1866.

CREAMERIES AND CHEESE FACTORIES.

The only creamery in the Belleville district, so far as I know, is one at Ameliasburg, Prince Edward County. The factories in this district are mostly conducted on the joint-stock system.

COST OF MAKING CHEESE—DAIRY COWS.

The cost of making cheese, including milk, drawing, manufacturing the cheese and boxing it, is about $1\frac{1}{2}$ cents per pound. Our cows are nearly all native cows, and very few are raised, the practice being to slaughter the young calves.

PREFERENCE FOR THE SHORTHORNS.

Not very much is being done to improve the cattle, but the preference of the people for that purpose is generally for the Shorthorn. We can get just as much milk from a well-graded cow as from a native one; and if we had to turn her into beef she would bring just about double as much as the common cow.

SOURCES OF PROFIT.

My dairy farming, on the face of the account, shews a loss, but it proves profitable by improving the land, and also because I have my profit, as between the cost of producing my fodder, and the price at which I charge it in making my calculations. I have made calculations as between stock raising and dairy farming and consider the latter to be most profitable.

HURON SALT.

In cheese making I have used the Stapleton brand of Huron salt, and find it equal in all respects to the best English brands, but it is more costly.

SYSTEM OF FARM ACCOUNTS.

I have adopted a system of keeping accounts on my farm, analogous to that suggested by Mr. Johnson, and find it very useful; in fact, I regard the keeping of accounts a necessity, though there are many farmers who never take stock, or keep accounts at all. I think our Public School curriculum is very defective in not devoting more time and attention to book-keeping.

BENEFIT OF DAIRY FARMING—IMPROVEMENTS IN CHEESE.

The dairying system has been of incalculable benefit to the farmers, and has attained a high degree of excellence of late years. The cheese made at our factory in 1866, and which then commanded the highest price, would now be regarded as a fifth or sixth rate article, if saleable at all, and the cheese which took the sweepstakes prize at the Centennial was inferior to the prize cheese at the Provincial Exhibition this year.

KETCHAM GRAHAM.

[Mr. K. Graham.]

PROFESSOR BELL'S EVIDENCE.

JAMES T. BELL, of Belleville, was called and examined.

AGRICULTURAL STUDIES.

He said:—I am the Professor of Mining and Agriculture at Albert College. Agriculture is taught as a regular branch of study, but farmers' sons as a rule do not appreciate the study of scientific agriculture.

CARE OF MANURE.

As to manures, I think that *everything* in the shape of refuse should be utilized, and that all manure should be kept under cover to protect it from the rain-fall and from the direct rays of the sun. Some of the best farmers, who know its value, are beginning to treat it in that way.

OIL CAKE—LINSEED—RAPE SEED—GRAIN—BRAN.

Those substances fed to cattle which contain most nitrogen, such as oil cake, linseed or rape seed, produce the best manure. After these would come the different kinds of grain and beans and peas. The manure produced by feeding bran I do not esteem very highly, though it produces soluble silica. There is generally enough of that in the soil to supply the wants of plants if it is brought into a soluble state by the use of alkaline and other salts.

EFFECTS OF LAND PLASTER.

There are two ways in which the use of land plaster assists vegetation, first by supplying sulphuric acid or sulphur, which is an important ingredient, especially in the seeds of plants. It also supplies lime in a soluble state. The sulphate of lime is slightly soluble. Four hundred and sixty ounces of water would dissolve one ounce of pure sulphate of lime or gypsum. Its other benefit is its mechanical effect in absorbing ammonia, which is an important element in vegetation. It also makes a double combination with some alkaline salts.

SEASONS AND SOILS MOST SUITABLE.

Plaster is much more effective in wet than in dry seasons, as a much larger portion of it dissolves and becomes available. It will not act so beneficially in soils in which there is a sufficient quantity of lime as in those in which it is deficient, and the reason it gives out in new land is that lime is mostly present in excess.

BENEFICIAL EFFECTS OF SALT.

I think salt, or chloride of sodium, might be applied advantageously upon land remote from saline waters. The chlorine would combine with the atmospheric moisture and form hydrochloric acid, and this acid would seize upon some other ingredients of the soil, while the soda would be liberated, and act on the silica of the soil and make it soluble. It is in this way that salt has an effect in strengthening and brightening the straw of the grain.

THE PHOSPHATES.

I agree with Mr. Barnard, the Director of Agriculture in the Province of Quebec, that the phosphates may be used without converting them into superphosphates if finely

[Prof. Bell.]

ground, and that the beneficial effect will be more permanent, if not so sudden, as there are many substances which are perfectly insoluble in the mass, which become soluble when comminuted. I think it is folly on the part of our farmers to allow these valuable fertilizers to be exported to other countries, instead of using them on their own lands. They are beneficial to almost every kind of crop, and especially valuable in renovating exhausted soils.

GREEN AND ROTTEN MANURE.

For ploughing-in, recent barn-yard manure will be more effective than rotted manure, which, however, is the best for top dressing or for application in immediate contact with the seed.

VALUE OF LIQUID MANURE.

Liquid manure is worth five times as much as solid manure, if properly saved and manipulated.

USE OF SAWDUST—TANKS—EARTH.

I am not very partial to the use of sawdust as an absorbent of liquid manure, as it is apt to promote the growth of fungoid spores, especially hardwood sawdust. The use of the tank and the water cart is what I would recommend, or if they were too expensive, a natural or artificial reservoir such as is used in earth closets. The liquid should either be mixed with earth or diluted with water, as it is too strong in its natural state, and should be applied at an early stage in the plant's growth. It should not be used fresh, but allowed to enter upon the first fermentation.

NECESSITY FOR DRAINAGE.

Drainage is very necessary in this country and sometimes as much so in dry as in damp soils, as the moisture is drawn from beneath the drain as well as from above.

FARMERS' ACCOUNTS.

I think the farmer should keep accounts of the transactions and operations of the farm, and I approve of the system set forth by Mr. Johnson.* For those farmers who are not sufficiently educated to use so elaborate a system, one in which their income and outlay could be debited and credited respectively would be serviceable, in connection with an annual stock-taking. Some such system as Mr. Johnson's might be advantageously introduced into our rural public schools.

RUST UPON GRAIN—ITS ORIGIN.

I believe that the rust found on different grains is all the same sort, merely modified by the season and the variety of the plant, and it is clearly established that it originated on the bramble and spread from it to the cereals. The retention of moisture in the soil is likely to produce the conditions necessary for its growth.

CHEESE AS AN ARTICLE OF DIET.

Referring to the dairy system, I strongly approve of cheese as an article of diet. A given quantity of cheese contains more actual food than any other article of diet we are acquainted with. It is best when it has just fairly ripened, and it is not desirable to use very old or strong cheese, otherwise than as a condiment. I think Canadian cheese is generally superior to English in its digestibility and its nutritious qualities. All cheese should be used with a large proportion of farinaceous food.

JAMES T. BELL.

* Described by Mr. Johnson in his evidence on Agricultural Education and Farm Accounts.

[Prof. Bell.]

Sittings to take oral evidence, held at Cobourg, October 19th, 1880. *Present—*
 MESSRS. AYLSWORTH (Chairman), and DYMOND.

MR. W. RIDDELL'S EVIDENCE.

WALTER RIDDELL, of Cobourg, was called and examined.

He said:—I am now farming for myself, and have been doing so for forty years. I was formerly a tenant farmer. I have given a good deal of attention to farm statistics. The following letter written by me in 1868 to the *Canada Farmer* will give statistics of the crops of this district as taken from the results of my own operations on an average farm :

REGISTER OF FARM CROPS.

To the Editor of the Canada Farmer :

SIR,—It is frequently asked—What is an average crop ? As some help to answer the question, the annexed tables for twenty-seven years, of the four principal crops raised in the country, namely, wheat, barley, oats, and peas, may be acceptable. The wheat and barley are, I believe, as exact and correct as such tables can be made ; and though every care has been taken with the oats and peas, yet every farmer knows that they are often, or at least occasionally, fed unthreshed, and therefore may not be so correct.

The farm on which the crops were grown is a good one, but has been all the time farmed under some special disadvantages. During the early part of the time it was wrought without sufficient means or suitable help to manage it to advantage ; then there was always a degree of uncertainty of having it more than the current year, and further, there was never anything like sufficient or suitable buildings on the farm ; so that a large part of the crop had to be stacked out, thus incurring waste and loss to the crop, increasing the amount and cost of labour, and preventing stock being kept with much advantage ; much of the farm cannot be wrought to the best advantage for want of under-draining, so that a wet spring followed by a dry summer had a very injurious effect on the products of the farm.

Of the prices given, the highest named was often only obtained for what was sold for seed ; and in the case of peas, the highest prices were only for early Kents, or some other fancy variety. They are, however, the prices actually obtained. The crop was sold always nearly as it was threshed, as there was no place where grain could be kept for any length of time after it was threshed. In the cases where there is no price given in the table it will be understood that none of the crop had been sold for those years that are left blank.

The dates given for beginning to plough and sow are the correct dates for this farm ; but owing to a large part of the farm being low, damp land, ploughing and sowing were often done in the neighbourhood sometime before the dates given. The same may be said of the dates for commencing and finishing harvest ; though correct for the farm, there was mostly harvesting done before, and also after, the dates given for beginning and finishing harvest. The dates, however, may be looked upon as a fair average for the section of country. Some years, it will be observed, that sowing was begun in the spring, before any ploughing was done. That was, of course, on land that had been fall-ploughed, and in years when there was no green sod to plough in the spring.

Computing from these tables the average yield and prices of each crop, for the whole period, the result will be found as follows :

[*Mr. Riddell.*]



SOUTHDOWNS.



HAMPSHIRE DOWN SHEEP.

STATISTICS OF FARM CROPS FOR TWENTY YEARS.

CROPS.	Average Bus. per Acre.	PRICE PER BUSHEL.		Began to Plough.	Began to Sow.	Began Harvest.	Finished Harvest.	Ploughing Stopped by frost.	REMARKS
		From.	To.						
1841		\$ c.	\$ c.						
Spring Wheat...	15	0 95		April 17	April 28	Aug. 7	Sept. 9	Dec. 15	
Barley.....	20	0 35							
Oats.....	46½	0 20	0 25						
Peas.....	13	0 50							
1842									
Fall Wheat....	12	0 70		April 5	April 19	Aug. 11	Sept. 10	Nov. 18	
Spring Wheat...	17½								
Barley.....	23		0 26 0 40						
Oats.....	54		0 16 0 20						
Peas.....	12½	0 50							
1843									
Spring Wheat...	29	0 77	0 90	April 20	April 26	Aug. 16	Sept. 8	Nov. 25	
Barley.....	13	0 40							
Oats.....	46	0 20	0 25						
Peas.....	12								
1844									
Spring Wheat...	20	0 75		April 13	April 10	Aug. 8	Sept. 13	Nov. 23	
Barley.....	18	0 55							
Oats.....	27	0 30							
Peas.....	15								
1845									
Spring Wheat...	18½	0 65	1 00	Mar. 31	April 2	July 31	Aug. 27	Nov. 22	
Barley.....	50	0 50	0 70						
Oats.....	32								
Peas.....	20								
1846									
Spring Wheat...	22	0 85	0 95	April 4	April 7	July 23	Aug. 11	Nov. 23	
Barley.....	39	0 55							
Oats.....	28	0 25							
Peas.....	12	0 50							
1847									
Fall Wheat....	12	0 85 0 90		April 26	April 26	July 30	Aug. 27	Nov. 20	
Spring Wheat...	22								
Barley.....	27		0 50						
Oats.....	34		0 25						
Peas.....	24	0 50							
1848									
Fall Wheat....	12½	0 80	1 00	Mar. 30	April 13	July 24	Aug. 18	Dec. 20	
Spring Wheat...	15	0 50	0 65						
Barley.....	26	0 43							
Oats.....	45	0 25							
Peas.....	27	0 50							
1849									
Fall Wheat....	38½	0 75	0 80	Mar. 29	April 21	July 23	Aug. 25	Nov. 29	
Spring Wheat...	18	0 80							
Barley.....	30	0 45							
Oats.....	45	0 25	0 30						
Peas.....	20	0 40	0 50						
1850									
Fall Wheat....	24	0 70	0 80	April 15	April 12	July 25	Aug. 23	Dec. 6	Finished ploughing.
Spring Wheat...	24	0 70	0 80						
Barley.....	24	0 60	0 65						
Oats.....	25	0 25	0 30						
Peas.....	19	0 30							
1851									
Fall Wheat....	13½	0 58 0 80		April 17	April 21	July 26	Aug. 30	Nov. 14	
Spring Wheat...	27								
Barley.....	26		0 50						
Oats.....	43		0 25						
Peas.....									
1852									
Fall Wheat....	29	0 71	0 80	April 27	April 29	July 29	Sept. 8	Dec. 1	Finished ploughing.
Spring Wheat...	32	0 69	0 90						
Barley.....	38	0 60							
Oats.....	45	0 40							
Peas.....	20	0 40	1 27						

[Mr. Riddell.]

CROPS.	Average Bus. per Acre.	PRICE PER BUSHEL.		Began to Plough.	Began to Sow.	Began Harvest.	Finished Harvest.	Ploughing Stopped by frost.	REMARKS.
		From.	To.						
1853		\$ c.	\$ c.						
Fall Wheat....	45	1 00	1 30	April 16	April 11	July 27	Aug. 29	Nov. 24	
Spring Wheat..	22	1 00	1 30						
Barley.....	33	0 80	0 60						
Oats.....	40	0 40	0 60						
Peas.....	20	0 80	1 00						
1854									
Fall Wheat....	16	1 20	2 00	April 17	April 20	July 27	Aug. 29	Nov. 29	
Spring Wheat..	27½	1 15	2 00						
Barley.....	19	0 80	1 00						
Oats.....	40	0 50	0 50						
Peas.....	26	1 00							
1855									
Fall Wheat....	28	1 66	2 00	April 17	April 24	July 30	Sept. 15	Nov. 16	
Spring Wheat..	27	1 50	1 85						
Barley.....	21	1 00	1 50						
Oats.....	41	0 50	0 50						
Peas.....	16	0 80	1 25						
1856									
Fall Wheat....	20	1 35		April 16	April 28	July 23	Aug. 30	Nov. 27	
Spring Wheat..	23	1 10	1 25						
Barley.....	37	1 05	1 25						
Oats.....	40	0 50	0 80						
Peas.....	10	1 00							
1857									
Fall Wheat....	24	0 90	1 50	April 14	April 30	Aug. 5	Sept. 8	Nov. 19	Finished ploughing.
Spring Wheat..	22	0 60	0 80						
Barley.....	12	0 50	0 60						
Oats.....	43	0 25	0 30						
Peas.....	12	0 60	2 25						
1858									
Fall Wheat....	3½	1 10	1 25	April 8	April 26	July 28	Sept. 3	Nov. 13	
Spring Wheat..	12½	1 00	1 25						
Barley.....	12	1 00							
Oats.....	25	0 40	0 50						
Peas.....	11	0 80	2 00						
1859									
Fall Wheat....	20	0 95	1 12	April 2	April 27	July 30	Aug. 25	Nov. 30	
Spring Wheat..	28½	0 85	1 25						
Barley.....	28	0 60	0 65						
Oats.....	40	0 35	0 50						
Peas.....	23	0 60	0 80						
1860									
Fall Wheat....	16	1 25		April 7	April 11	July 27	Sept. 4	Nov. 24	
Spring Wheat..	24	1 00	1 10						
Barley.....	32	0 65							
Oats.....	50	0 25							
Peas.....	23	0 50	0 75						
1861									
Spring Wheat..	18½	0 87		April 17	April 22	Aug. 6	Sept. 14	Dec. 20	
Barley.....	28	0 45							
Oats.....	42	0 25	0 30						
Peas.....	19	0 45	0 75						
1862									
Spring Wheat..	12	0 80	0 85	April 24	April 29	Aug. 2	Sept. 11	Nov. 14	Finished ploughing.
Barley.....	27½	0 60	1 00						
Oats.....	36	0 50							
Peas.....	24	0 50	0 65						
1863									
Spring Wheat..	15	0 75	0 85	April 18	April 22	July 27	Sept. 3	Nov. 27	Finished ploughing.
Barley.....	32	0 56	1 00						
Oats.....	44	0 30	0 60						
Peas.....	22	0 50	0 85						
1864									
Spring Wheat..	13½	0 80	1 00	April 6	April 16	July 25	Aug. 31	Nov. 28	
Barley.....	38	0 80	1 00						
Oats.....	52	0 40	0 50						
Peas.....	12	0 80	2 25						
1865									
Spring Wheat..	13	1 15	1 40	April 24	April 3	July 26	Aug. 29	Dec. 1	
Barley.....	30	0 70	0 75						
Oats.....	48	0 30	0 40						
Peas.....	24	0 60	2 50						

CROPS.	Average Bus. per Acre.	PRICE PER BUSHEL.		Began to Plough.	Began to Sow.	Began Harvest.	Finished Harvest.	Ploughing Stopped by frost.	REMARKS.
		From.	To.						
1866		\$ c.	\$ c.						
Spring Wheat...	19	1 35	1 60	April 18	April 14	July 28	Aug. 24	Nov. 27	
Barley.....	33	0 60							
Oats.....	45	0 30	0 40						
Peas.....	25	0 60	0 75						
1867									
Fall Wheat....	24	1 40	1 45	April 13	April 18	July 29	Aug. 27	Nov. 22	
Spring Wheat...	13	1 40	1 75						
Barley.....	22	0 78	1 25						
Oats.....	40	0 40	0 60						
Peas.....	20	0 80	1 00						

The *Wheat* crop for the whole twenty-seven years give an average of nineteen and a-half bushels per acre; and the average price for all the wheat sold during that time was within a small fraction of one dollar per bushel. Of *Barley*, the crop for the twenty-seven years yielded an average of twenty-seven and three-quarter bushels per acre, and the average price for all that was sold was a little over sixty-seven cents per bushel. *Peas* yielded on an average during that time twenty bushels to the acre, and the price for which they were sold gave an average of seventy-two cents per bushel. *Oats* gave an average for the same time, of forty-two bushels per acre, and the price for the total quantity sold gave an average of thirty-two cents per bushel.

WALTER RIDDELL.

Cobourg, March, 1868.

The following tables will give similar returns to the end of 1879:

CROPS.	Average Bus. per Acre.	PRICE PER BUSHEL.		Began to Plough.	Began to Sow.	Began Harvest.	Finished Harvest.	Finished Ploughing.	REMARKS.
		From.	To.						
1868		\$ c.	\$ c.						
Spring Wheat...	11	0 85	1 25	April 13	April 17	July 11	Aug. 10	Nov. 18	{ Ploughing could be done till Nov. 27.
Barley.....	18	1 00							
Oats.....	16	None	sold						
Peas.....	7½	0 65	2 00						
1869									
Fall Wheat....	17	1 10	April 15	April 20	Aug. 2	Sept. 16	Nov. 8	Stopped by frost.
Spring Wheat...	16	0 85	1 00						
Barley.....	22	0 75							
Oats.....	33	0 30	0 40						
Peas.....	23	0 52	1 25						
1870									
Fall Wheat....	3½	None	sold	April 14	April 25	July 27	Aug. 18	Nov. 21	{ Some ploughing could be done on Dec. 6th.
Spring Wheat...	13	1 10	1 35						
Barley.....	27	0 70	0 83						
Oats.....	37	0 35	0 50						
Peas.....	17	0 77	0 90						
1871									
Fall Wheat....	20	1 10	1 30	April 6	April 8	July 15	Aug. 19	Nov. 22	
Spring Wheat...	13	1 15	1 45						
Barley.....	24	0 52	0 70						
Oats.....	27	0 40	0 50						
Peas.....	22	0 68	1 25						
1872									
Fall Wheat....	18	1 35	..	April 22	April 18	July 20	Aug. 17	Nov. 15	{ Some little ploughing Nov. 24 and 25.
Spring Wheat...	18½	1 17	1 30						
Barley.....	25	0 65	0 70						
Oats.....	40	0 40	0 50						
Peas.....	13	0 40	1 75						

[Mr. Riddell.]

CROPS.	Average Bus. per Acre.	PRICE PER BUSHEL.		Began to Plough.	Began to Sow.	Began Harvest.	Finished Harvest.	Finished Ploughing.	REMARKS.
		From.	To.						
1873		\$ c.	\$ c.						
Spring Wheat...	9½	1 10	1 50	April 15	April 22	July 23	Sept. 1	Nov. 12	
Barley.....	18½	0 98	1 10						
Oats.....	30	0 40	....					
Peas.....	28	0 60	2 00						
1874									
Spring Wheat...	13½	0 90	1 05	April 21	April 30	July 27	Aug. 29	Nov. 20	{ A little ploughing done on Nov. 28.
Barley.....	30	0 85	1 00						
Oats.....	40	0 40	....					
Peas.....	20	0 68	2 00						
1875									
Fall Wheat.....	14½	1 08	1 12	April 10	April 14	July 20	Aug. 30	Nov. 16	Stopped by frost.
Spring Wheat...	19	1 00	1 10						
Barley.....	22½	0 58	0 60						
Oats.....	30	....	0 50					
Peas.....	19	0 66	2 00						
1876									
Fall Wheat.....	8	None	sold	April 19	April 25	July 20	Aug. 18	Nov. 7	{ Ploughing could be done till Dec. 1st.
Spring Wheat...	12	1 05	1 80						
Barley.....	11	0 75	....					
Oats.....	34	0 35	....					
Peas.....	10	0 70	1 25						
1877									
Fall Wheat.....	25	1 20	1 50	April 9	April 10	July 13	Aug. 20	Nov. 26	{ Ploughing could be done almost every week during Dec.
Spring Wheat...	20½	1 03	1 18						
Barley.....	18	0 50	0 60						
Oats.....	34	None	sold						
Peas.....	17	0 67	1 00						
1878									
Fall Wheat....	12	0 95	1 15	April 4	April 2	July 16	Aug. 15	Nov. 14	{ Ploughing could be done (at times) for some weeks after that time.
Spring Wheat...	8	0 90	0 91						
Barley.....	20	0 95	1 00						
Oats.....	32	0 35	0 40						
Peas.....	14	0 60	0 85						
1879									
Spring Wheat...	9½	0 95	1 40	April 21	April 23	July 19	Aug. 19	Dec. 12	
Barley.....	25	0 62	0 63						
Oats.....	36	0 35	0 40						
Peas.....	20	0 65	0 90						
1880				April 10	April 16	July 16	Aug. 20		

SPRING AND FALL WHEAT—DECLINE IN THE YIELD.

I am growing both spring and fall wheat. The average yield of the former for forty years has been thirty-two bushels to the acre; for the last three years it would be about twelve or thirteen bushels. I cannot account for the falling off in the yield. It does not appear to yield grain in proportion to the straw, and is subject to attacks from the Hessian fly and the midge; but apart from these pests there has been an unaccountable falling off in the yield. The rust has attacked the wheat extensively this year.

FYFE AND CLUB WHEAT—WHITE RUSSIAN.

Fyfe and Club wheat are the standard varieties, but I have also tried the White Russian and others. The newer varieties have proved very little better than the others. I have noticed that the wheat fails on new as well as on old land.

MANURES—PLASTER—SALT.

I use barn-yard manure, salt, and plaster. I apply from 100 to 300 pounds of salt [Mr. Riddell.]

to the acre. The results are very uncertain, as some years it has a very good effect, and other years its benefits are not appreciable. It generally has the best effects in dry seasons, or on dry soil.

FALL WHEAT CROPS—WINTER-KILLING—ITS CAUSE.

Fall wheat does very well if we can get it through the winter safely. I believe the winter-killing is largely due to the land having been denuded of forest. Where the land is sheltered on the north and west there is almost always a good crop.

VARIETIES OF FALL WHEAT.

The varieties of fall wheat I have planted are the Hutcheson, Soules and Diehl, with a little of the Clawson. The Clawson is giving the best results at present, but formerly the Soules did better than any other.

COST OF WHEAT CROP.

I estimate the cost of a wheat crop per acre to be as follows: Interest or rent, \$3; preparation of land, \$4; seed, \$1.50; sowing, harvesting, and housing, \$2.25; threshing, 55 cents; rolling, cleaning, etc., 50 cents. Total, 11 dollars 80 cents. If the land is summer-fallowed there would be another year's rent, and at least another ploughing, so that the cost of fall wheat on summer fallow would be \$16. Manure is occasionally put on, but it could not be charged to one year's crop. Its cost would be perhaps, from \$2 to \$3 an acre.

ROTATION OF CROPS.

My rotation is as follows, as nearly as possible: peas on sod; I then plough the land twice in the fall, cultivate it in the spring, and sow either with spring wheat or barley; then a crop of oats or barley; then a hoed crop; then barley or spring wheat, seeding down with it. I keep the land two years in hay or pasture. Barley, oats, and peas are generally fairly successful crops.

EFFECT OF SALT ON ROOTS.

Salt has a very marked effect on mangolds, making both tops and roots cleaner and brighter. I have experimented very carefully with salt, and am quite convinced of its beneficial effects on Mangolds and Swedish turnips.

BONE DUST—PHOSPHATES.

I have also tried bone dust and mineral superphosphate; the former paid me, but I do not think the latter did. The superphosphate costs about \$30 per ton. The bone dust had only a slight effect the first year, but it lasted for a long time. The superphosphate had an effect the first year, but not enough to pay for the cost of the manure.

INDIAN CORN—COST OF CROP.

Indian corn is usually a fairly successful crop, though it is sometimes damaged by late spring or early fall frosts. The Indian corn produced falls short of the demand, and a small quantity is imported for feeding purposes. I estimate that a crop of Indian corn costs \$18.10 per acre, without charging anything for the manure but for the cost of putting it on. I use the stalks for feeding cows, and they are valuable for that purpose.

[Mr. Riddell.]

STOCK IMPROVING—FARM ACCOUNTS.

I think the general quality of the stock in our township is improving. I keep farm accounts, but do not think that the farmers as a rule do so. I have a day-book in which I record farm transactions, and tabulate them at the end of the year, and a cash-book. I do not keep an account for each field, it is too much trouble.

WALTER RIDDELL.

Witness adds the following:—The farm on which the crops from 1841 to 1867 inclusive was raised is a first-class farm. The farms on which the rest of the crops since then was grown cannot be said to be more than second-class—this accounts in part for the great falling off in the crops. W. R.

MR. WM. NOBLE'S EVIDENCE!

WM. NOBLE, of the Township of Haldimand, said:—

TWO LARGE FARMS.

I have a farm in Haldimand and another in Hamilton township—430 acres in the former and 240 in the latter. I have sixteen cows and make a good deal of cheese at home.

DECLINE IN SPRING WHEAT—BARLEY.

The yield of spring wheat for the last four or five years has been decreasing with me, and this year it will not average more than ten bushels to the acre. Barley produces from thirty to thirty-five bushels to the acre, and some this year went as high as fifty bushels.

PEAS—OATS.

Peas do well, and are not much subject to the bug. Oats are also a profitable crop, the yield being from thirty-five to forty bushels to the acre, and sometimes fifty bushels per acre.

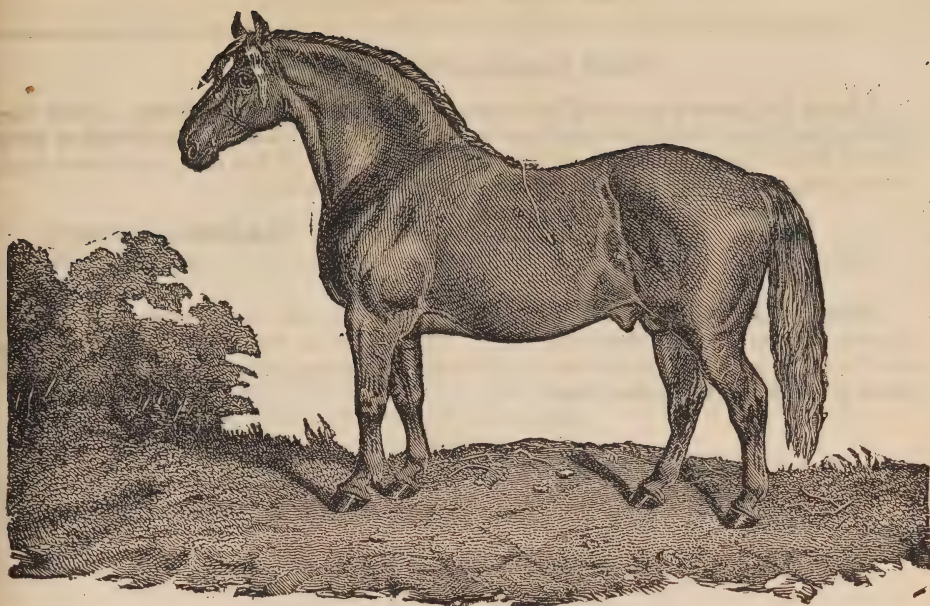
SYSTEM OF CROPPING.

I generally break up my sod and sow peas, then either wheat or barley. If barley, then I would sow wheat the next year and seed down, keeping the land in grass two or three years. I generally mow two years and pasture one. If the land be rolling I would sow peas and then seed down with wheat or barley. In that rotation I would manure after peas and before barley, putting on from twenty-five to thirty loads to the acre on poor land. I raise hoed crops, but only for my own use.

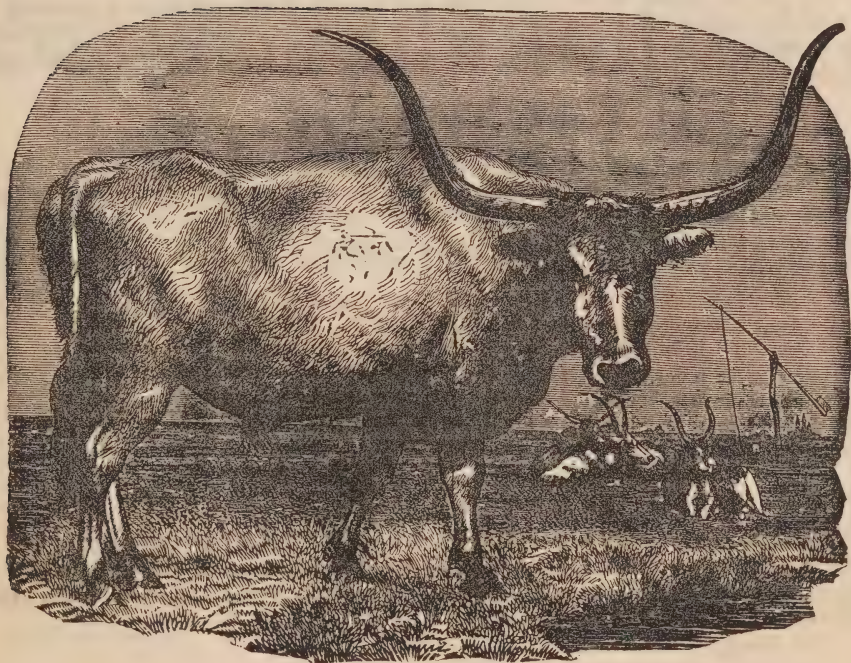
FORMER YIELD OF FALL WHEAT.

Twenty years ago, fall wheat yielded thirty-seven bushels to the acre. Last year, Clawson wheat yielded me only twenty-four bushels per acre, and that on the choice field of the farm. I do not think it is safe to grow fall wheat unless the fields are well sheltered.

[Mr. Noble.]



SUFFOLK PUNCH.



HUNGARIAN BULL.

CAUSES OF SPRING WHEAT FAILING.

The failure of the spring wheat, I believe to be due partly to the seed having run out, and partly to the insect pests. Barley at fifty cents pays better than spring wheat.

USE OF SALT AND PLASTER.

I have used some plaster and salt, and find plaster excellent for clover. Salt I use on wheat and barley, and it has a good effect in brightening and stiffening the straw.

WILLIAM NOBLE.

Sittings to take oral evidence, held at Bowmanville, Oct. 20th, 1880. *Present—*Messrs. DRYDEN (Chairman), DYMOND and AYLSWORTH.

MR. H. MIDDLETON'S EVIDENCE.

HENRY MIDDLETON, of the Township of Clark, was called and examined.

He said:—I am a farmer engaged in mixed husbandry.

FALL WHEAT—SPRING WHEAT—BARLEY.

I do not raise much fall wheat, and it is cultivated only to a limited extent in this district of late years, owing to its liability to winter killing. We tried spring wheat at first as a substitute, but of late years we have been raising barley. The failure of the fall wheat has been pretty general.

FORMER SUCCESSFUL CULTIVATION OF FALL WHEAT—RECENT FAILURE.

Eighteen or twenty years ago, before the forest had been all removed, it was a successful crop. I have made no attempt to renew its cultivation until last year, and the attempt was a failure, owing to the crop having been winter killed.

VARIETIES OF SPRING WHEAT.

I have tried different varieties of spring wheat, the Red Fern included, but the last two years it has been a failure. About four years ago we imported some wheat directly from Russia. It did well the first year, but afterwards it was no better than the home grown seed. It seemed to be attacked by the blight, and was also troubled with the midge. This year I have sown some Arnecta wheat. It yielded about twelve bushels to the acre.

USE OF SALT.

I have tried salt as a preventive of the blight. Some years it seems to be effective and others not. I have not tried any other fertilizers. The uncertain effects of sowing salt, are, I believe, due to the difference in the seasons on new land. Wheat is as badly affected by the blight, or black rust, as that sown on old land. The salt is generally sown broadcast after the seed is sown.

AVERAGE CROP OF SPRING WHEAT.

During the last eighteen years the average crop of spring wheat has been about twenty bushels to the acre. I have not yet fully tested the Arnecta wheat, but the re—
[Mr. Middleton.]

sults in the neighbourhood are good, having yielded as high as twenty bushels to the acre. The Arnecta is not as good in quality as the Fyfe, and the flour is inferior, probably because the millers have not got hold of the way of grinding it. The Red Fern does very well, but is hard to thresh, and is not liked on that account. Some say that the Arnecta is the same as the Wild Goose whea^t.

COST OF SPRING WHEAT GROWING—PRICE OF WHEAT.

In estimating the cost of a crop of spring wheat, I would put the rent, or interest, at \$4 per acre; preparation of land, \$2.45; seed, \$1.90; sowing, about 50 cents per acre; cutting and binding, \$1; setting up and drawing in, 65 cents; threshing, \$2; other charges, \$1.50; or about \$14 altogether. The price of wheat has not averaged quite \$1 per bushel for the last eighteen years.

MANURING WITH ROOT CROP.

I generally put on the manure with the root crop, and if more is required, where it will be of most benefit. The manure on old land should be applied about once in seven years, about twelve loads to the acre. It would be worth about \$1 per load, so that \$2 per acre would be a fair charge for it.

INCREASED CULTIVATION OF BARLEY.

Barley has succeeded pretty well in our district for some years, and its cultivation is on the increase. Occasionally it is affected by the frost. The crop, I have noticed, turns yellow after a night frost, though I have noticed it assume the same appearance when there had been no frost. The spring wheat is somewhat affected in spots in the same way, when it is exposed to the north-west winds.

THE PEA CROP—THE PEA BUG—CORN.

I have heard no complaint of the pea bug this season, though they were common in the front of the township last year. Peas are a very profitable crop, producing from 20 to 40 bushels to the acre. I do not regard this as a favourable section for the extensive growth of corn.

USUAL ROTATION.

I do not follow a very rigid rotation of crops, as my farm is not laid out as well as I would like. After a root crop I sow wheat and seed down. After the hay I sow the land in peas, then wheat, then oats or barley, and then I seed down.

PHOSPHATE AND BARN-YARD MANURE.

I have tried phosphate of lime on turnips for one year, putting salt on another part of the field, and putting barn-yard manure alone on the remainder. Barn-yard manure had been put on the whole field. The land sown with phosphate of lime yielded about double that on which only barn-yard manure was put. That sown with salt was very nearly as good as the land on which the phosphate was put. The phosphate I used came from Brockville, and I think it is a mineral phosphate. I have used none since, as it is very expensive.

GODERICH SALT.

I first used Liverpool salt, but have tried the Goderich salt since. I and my neighbours have come to the conclusion that it is not so strong as the English article. We

[*Mr. Middleton.*]

could not see the same effect from it, though the season might have had something to do with it.

UNDER-DRAINING.

I have done considerable under-draining, as my land is rather low, and when I took it every hollow was a swamp. I first cut a number of open ditches in these hollows, and to these I had under-drainings. I noticed that the deeper the drains were, the more benefit I got from them. My deepest drains were about five feet deep. A very few crops paid for the expense of draining.

HIRE OF LABOUR.

I think farmers have made a great mistake in years past, in hiring men only for the summer months, and allowing them to go idle in the winter, the result being that now it is almost impossible to hire a man by the year.

HENRY MIDDLETON

MR. JAMES THOMSON'S EVIDENCE.

JAMES THOMSON, of Brooklin, Ontario county, was called and examined.

He said:—I have been farming in Brooklin for about thirty years, and was on a farm in Scotland since my infancy. The soil on part of my present farm is a clay loam, and part of it is a pretty stiff clay. The land at one time was inclined so be wet. I follow mixed husbandry.

SYSTEM OF FARMING.

When I break up sod I either summer fallow it or sow peas. If the latter, I would follow peas with fall wheat if the land was in good tilth. After wheat I would sow oats; then a root crop; then spring wheat, with which I would seed down. If the land was not in good condition, after wheat, I would follow with a root crop.

FAILURE OF SPRING WHEAT.

During the last two or three years we have grown less spring and gone more into fall wheat. If I had more sod land than I cared to sow in peas, I would sow some oats. I agree with the last witness as to the fact, and the cause, of the spring wheat failure. I have always grown some spring wheat, and my average yield is about thirty-one bushels to the acre.

THE WILD GOOSE WHEAT.

The variety I am sowing at present is the Wild Goose wheat or the Arnecta—for there is no difference between them, according to the decision of the grain merchants of Toronto. It makes good bread if mixed with a little fall wheat. Since the millers have got into the way of grinding it they do not complain of it as they did at first.

A PECULIARITY.

There is one peculiarity in this wheat which I have noticed. I have a patch of it which, after being laid out, got bleached by the heavy rains, and upon looking at it afterwards I have noticed that it looks perfectly white and pure, and full of flour.

[*Mr. Thomson.*]

ARTIFICIAL FERTILIZERS.

I have ceased growing barley, because I believe the persistent growth of it tends to exhaust the land on account of the lack of straw for manure.

EFFECTS OF PHOSPHATE OF LIME.

I have used considerable phosphate of lime. The first I purchased in Montreal, and found it good. Though it cost \$40 per ton, I am satisfied I got my money back, and a good percentage besides. Afterwards I purchased in Toronto, and continued to do so for seven or eight years, until from adulteration, or some other cause, it appeared to be utterly worthless. I used it principally on grain crops—wheat and oats, and applied it to the surface after the grain was sown—about 250 or 300 pounds to the acre. I have carefully compared the result with those from land not so treated, and am perfectly satisfied of its beneficial effects.

QUALITY OF THE PHOSPHATE.

It was eight or nine years ago that I noticed it was adulterated. There was no alteration in the price at the time. I and my brother both noticed its different appearance when we were sowing it. Instead of being a dark colour it was a lightish gray, and was like fine sawdust—it had no weight to it. As soon as I noticed its appearance I telegraphed to the maker, and he replied to “go on and sow, it would turn out all right.” I sowed it, leaving some strips in the field without it. Neither I nor my friends could detect the slightest difference in the crop in favour of the land where it was applied. The manufacturer never gave any reason for its failure, though his attention had been drawn to it. Since that time it has been sold for \$10 a ton less, but I have never bought any.

USE OF BONE DUST.

I have since been using bone dust, purchased from a Toronto firm, and it is proving beneficial to the land. I applied three and a half to four hundred lbs. to the acre, and it costs \$27 a ton in Toronto. Timothy upon which it is sown is twice as good a crop as that without it.

SALT AS A FERTILIZER.

I think that salt is beneficial to the land, not as a fertilizer but as a fertilizing agent; and it brightens and stiffens the straw, besides keeping the land moist in dry seasons. I apply it very liberally, mixed with droppings from the hen coop and ashes. I use Goderich salt principally, and it costs \$6 a ton in Brooklin. I have tried Liverpool salt, but could find no difference between it and Huron salt.

LAND PLASTER.

I use plaster on grain and root crops, but do not think it has the same effect now that it used to have if applied in the same quantity. I do not think this is due to deterioration in the plaster, but to the fact that there is now none of the virgin soil left to aid the action of the plaster. The plaster is from Oswego, and costs in Whitby from 90 cents to \$1.20 per barrel. Prof. Croft, some years ago, advised me to get the white plaster, as discoloured plaster contains extraneous matter, while the white plaster is pure.

MANAGEMENT OF BARN-YARD MANURE.

I am in the habit of leaving my stable manure in the yard without turning it. I take it out green in the fall and plough it in. It is not kept under cover. I have never tried top dressing with farm-yard manure.

[Mr. Thomson.]

SUBSOILING—GOOD RESULTS,

I have tried subsoiling with good results, using one plough after another, as I have never seen a subsoil plough that suited me. The object is to loosen the soil, not to turn it up, and it is apt to become packed below, and roots, instead of striking downward, branch off laterally when they come to the subsoil. The effect upon root crops especially is very marked.

UNDER-DRAINAGE.

I have carried on a pretty thorough system of under-drainage, having spent \$3,000 or thereabouts on it. My drains are all three feet deep, and it depends entirely on the nature of the soil whether it would be better to make them deeper. On my land, with drains about a rod apart, the cost is about \$40 per acre. I have no reason to regret the money I have expended on drainage, for previously it depended entirely on the season whether I had a crop at all or not, and now a good crop is a matter of certainty.

FEEDING CALVES—THE SHORTHORN.

I always feed my calves with milk, and after they are five or six weeks old they are allowed to feed when they please from a box full of corn meal which I leave in the field for them. After they are three months old they are allowed all the skim milk they can drink. My cattle are principally Durham grades, and I use a Shorthorn bull for breeding purposes. I think they are the best breed for general purposes.

JAMES THOMSON.

Sitting to take oral evidence held at Toronto, Oct. 21st, 1880. *Present*—Messrs. BROWN (Chairman), J. B. AYLSWORTH, and A. H. DYMOND.

MR. DAVID SMELLIE'S EVIDENCE.

DAVID SMELLIE, Concord, Township of Vaughan, called and examined.

To the Chairman.—I have been engaged in farming operations all my lifetime, not very extensively, however.

GRAIN CROPPING.

Mine is a general farm, consisting of 170 acres cleared. We raise wheat, barley, peas, and oats. The soil is good. I raise fall and winter wheat, generally having about twenty or thirty acres every year in wheat.

SENECA WHEAT DOING WELL—FULTZ WHEAT.

For the last two or three years we have raised Seneca wheat. Three years ago I raised the Fultz. The Seneca has done pretty well, about as well as anything I have had. There are some other kinds which some think better, but I have always found the Seneca do as well as anything else. Fultz wheat has done very well, but we don't know as much about it as the other kind.

AVERAGE YIELD.

Taking two or three years together I don't suppose my average would run more than twenty bushels an acre. Excluding this year it would not run as high as twenty.

[*Mr. Smellie.*]

five. Taking any ordinary three years, I don't think it would run much more than twenty bushels. Some farmers in my neighbourhood are more successful than I am, as some of the farms near mine are more adapted for wheat, being higher and seeming to do better.

FORMER CROPS OF FALL WHEAT.

Fall wheat has been cultivated on my farm forty years, more or less. I remember the time when my crops were a great deal larger than they are at present. I think there is a good deal in the winters to make the crops less now than they were. We have less snow now than we had, and I think that has a great deal to do with it.

EFFECTS OF SHELTER.

The country is getting more cleared of timber, and that is another thing to account for the diminution in the crops. The more bush and shelter the greater the crop of wheat. There is no doubt that a sheltered field will produce more grain than one exposed. A field of mine that is sheltered by a piece of bush, I have observed never fails at all, or at least, never so much as the others.

MIDGE AND HESSIAN FLY.

Of course we have other things to contend with, such as insects, which we didn't have long ago. Lately we have had the midge and the Hessian fly, which we have had pretty largely this summer. It has ruined the spring wheat almost altogether this year. On high lands it was not so bad. As the spring wheat crop has been a failure I don't know but that it is just as profitable to grow fall wheat, even under these circumstances. I have never kept an account of what the cost of raising wheat per acre is.

ROTATION OF CROPS.

My rotation is something as follows: First year, summer fallow; next year fall wheat, seed down with timothy, and let it lie three years in grass; then peas on the sod, and probably fall wheat on the peas. This would be the rotation I would follow if the crops were successful, but sometimes you hardly know what to sow if the crops have been a failure.

INCREASE OF THISTLES—FALLOWING.

Now that the thistles have become so very bad I believe we will have to fallow a good deal more frequently. Summer fallow is the only cure for thistles. The field we are going to fallow I always plough in the fall of the year, and in the spring we run through it with a cultivator. We don't allow the thistles to peep at all that season if possible, because if you do you don't seem to kill them. If you never let them get their heads above the ground you will master them for about seven or eight years, provided there is no seed comes to your place from your neighbours.

MANURING.

We give the summer fallow a little manure. We don't calculate to give the summer fallow so much manure as in the fall of the year, after peas. During the seven or eight years' rotation we manure pretty thoroughly, putting on all we have. We would give it more if we had it, in fact we can't get enough manure now. We use up all the straw we can get for that purpose. I generally calculate to use about twelve or fourteen good sized waggon loads per acre. About ten loads would be a pretty fair quantity for the fallow. The amount depends on the quality of the manure and the requirements of the field. I look to the sod as an additional contribution to the manure of the soil.

[*Mr. Smellie.*]

KILLING THISTLES—A CULTIVATOR.

I do not use a gang plough for cutting down thistles, but employ a cultivator for that purpose. The teeth of this cultivator are made very wide, and we can get over the land quicker, and it answers the purpose as well as a gang plough. The gang plough is going into use now very much with those who have not cultivators like mine. The cultivator I use is different from a great many others. There are a great many cultivators I don't consider any use at all. The one I use is made by a man named Munshaw. It is an improvement on the "Carleton Patent." The man lives near Richmond Hill, but he is out of the business now.

SPRING WHEAT A FAILURE—WILD GOOSE WHEAT.

I grow a little spring wheat every year. It has been a failure the last two years, especially this year. Some varieties have done pretty well, such as the Wild Goose wheat, but it is a coarse wheat, and I don't care much about it. Millers don't like the Wild Goose wheat if they can get anything else. It is a hard, flinty wheat, and doesn't make white flour.

FYFE WHEAT—WHITE RUSSIAN.

It is not equal to the Fyfe wheat. There is no wheat like Fyfe wheat. The Fyfe has run out with us; it won't do at all. I have seen us have twenty-five or thirty bushels of spring wheat to the acre a good many years ago, but now we can't get more than ten or fifteen. I have grown White Russian, and it does very well. It did the best of anything I had last year or this year.

BARLEY CROP—OATS—YIELD.

Barley is a very important crop with us. If the land is in pretty good order, I obtain from thirty to thirty-five bushels an acre. We don't like to grow too much barley, because we don't get much manure from it. The straw goes away to almost nothing. I prefer oats to barley as a coarse grain. Oats yield with me forty to fifty bushels an acre; I have had sixty bushels an acre.

PEAS—THE PEA BUG—RYE—FERTILIZERS.

Peas used to do very well with us until the last two years, and since then the bug has almost destroyed the crops. Some people this year sowed their peas very late after everything else was in, to see how it would work. I sowed mine very late, but the bug was just as bad as if I had sown it earlier. I don't grow rye. I have never used any fertilizers except barn-yard manure, neither salt, gypsum, nor anything except what we make on the farm. I have not tried superphosphates.

UNDER DRAINING.

I have been under-draining more or less the last twenty years. I am pretty nearly through with it now. We under-drain through all the slacks, some fields requiring much more under-draining than others. There is nothing pays better than under-draining. I cannot tell what the expense is of under-draining per acre. Wherever there is a low place where it is likely to be wet in the spring we usually under-drain it.

GOOD EFFECTS OF DRAINING.

Under-draining has favourably affected the produce of my wheat. The effect of
[*Mr. Smellie.*]

under-draining is that it takes away the under water, and of course the surface is dry, and the wheat is not so apt to be winter-killed. The cause of wheat being winter-killed is the fact of its having a cold, damp bottom. We have rust sometimes. The draining helps to keep down the rust a great deal. We have always found low places the worst for rust.

COST OF TILE DRAINS.

We use tiles for under-draining. For two-inch tiles we pay \$8 a thousand; three-inch, \$12; and four-inch, \$16. At that price we have to take them from the tile yard, which is about ten miles distant. We can't get any tiles closer than that.

CATTLE DAIRYING.

I keep a few head of cattle, but have never gone into stock raising particularly. I have never gone into fancy stock raising, nothing thoroughbred. I don't do much in the dairy business. We manufacture the butter at home, a little for our own use, and a little to sell. I don't keep a thoroughbred bull. In raising cattle I try to breed from thoroughbreds. In our neighbourhood they are all Durhams. The cattle I have on my place are a cross between Durhams and Ayrshires. I think the Durhams are the best breed for feeding purposes, but not so good for dairy purposes. For a good milk cow I would not choose a thoroughbred Durham.

WINTER FEEDING—ROOTS.

I have not done much in raising cattle for the market. I have no particular method of feeding cattle through the winter. We raise as many roots as we can for feeding them. Mangolds and carrots seem to be the most profitable roots to raise in our section. Turnips seem to be a failure because of the fly which attacks them, and destroys them completely sometimes. We have adopted no particular means of exterminating the fly.

PASTURING IN SUMMER.

I pasture my cattle in the summer time. I have no unbroken pasture land, and turn the cattle into the fields that I have seeded down. Under these circumstances we don't adopt any system of summer feeding. We generally calculate to keep as much in pasture as will feed them during the summer.

THOROUGHbred COTSWOLDS—SOUTHDOWNS.

The sheep I have are all Cotswolds. This variety is a favourite in our neighbourhood. They are thoroughbred. We raise them both to sell the wool and the mutton. I have never gone into selling them for breeding purposes. I have not tried any other description of sheep. There are a few Southdowns in my neighbourhood.

CLIP OF WOOL—PRICES—FEEDING.

From the Cotswold I get seven or eight pounds of wool. I have always been able to sell my wool, but not at a very high figure. This year after clipping time was over, I think it was 27 cents I got for mine, and last year the price was not so high. Of course if the sheep are better fed the wool is more abundant. We have a shed where the sheep can go in and out as they please. I don't think it is good to keep sheep too warm in winter.

ARBORICULTURE—SILVER MAPLE—NORWAY MAPLE.

I think it is a very good thing to have trees planted extensively about a farm. I
[Mr. Smellie.]

have planted more trees on my farm during the past four years than any one else in my neighbourhood, I suppose. I have planted them along the front of the place, up the lane towards the house, and around my orchards. I should like to have more of them planted. I have been planting the Silver maple, but if I were going to plant again I would plant the Norway maple, which is a much nicer tree. It doesn't grow so fast, but it grows a closer and prettier top, and swells out faster in the trunk. It is a pretty rapid grower.

MANAGEMENT OF THE TREES.

I have had some of these trees in four years. They were ten feet high when I got them from the nursery. I cut the tops off down to eight feet the first year to make them all a uniform height. Last year I cut them back nearly the whole year's growth. They are getting too much top. I am the only one that has imported them in our part of the country. There is no trouble in getting them to grow, provided the trees are properly taken care of after being taken up. I have not lost one tree out of 175 I planted. I don't adopt any particular plan. In planting the trees I dig a hole two feet deep and about four feet wide. I got all my trees from the United States. I brought over twenty Norways one year past last spring. The Norway is a very hardy tree.

PROTECTION TO ORCHARDS AND WHEAT FIELDS.

I have my two orchards surrounded with Norway spruce as a protection. I have not adopted the planting of Norway spruce as a protection for my wheat fields. It costs a great deal of money to go into that business, and you have to put up a fence to protect them from your stock. The spruce about my orchard are not very high yet, but when they grow up there is not the least doubt that they will do good to the orchard. The country is becoming so much cleared that I think more trees should be grown. There is as much expense in protecting a tree as there is in planting it. The Silver maple cost me, paying duty and all expenses, 29 cents each. I have planted them twenty-one feet apart.

COST OF PLANTING IN FIELDS.

Q. What would be the cost of planting them around, say a ten-acre field? A. Twenty-one feet apart would take 125 trees; digging holes and planting, 10 cents each; the whole would cost \$38.75. You can't get good silver maples in this country; there are a few, but they are all a miserable kind. All that I have seen in the nursery in Toronto are very crooked. I couldn't get a tree there to suit me. I went to Hamilton, and could have got good trees there, but as they were not grown on a soil similar to my own, I did not care about taking them.

FRUIT GROWING—YOUNG ORCHARDS.

My orchards are young yet, and I can't speak much about the quality or quantity of the fruit. I had an orchard, but I rooted it all up. In one orchard I have planted apples, pears, plums, cherries, and a few other small fruits. The other orchard is wholly an apple orchard. Among the varieties which I think succeed best is the Northern Spy, Rhode Island Greening, Baldwin, Roxburgh Russet. I have chosen them for their hardiness. The trees are doing well, but they have not yet borne fruit. I would recommend tree planting and under-draining as two things which should be gone into by farmers generally.

DAVID SMELLIE

[Mr. Smellie.]

MR. JOHN DOUGLAS' EVIDENCE.

JOHN DOUGLAS, of Blantyre, Township of St. Vincent, County of Grey, was called and examined.

To the Chairman.—I own 200 acres. One lot is pretty largely a bush lot. I have only cleared 25 acres of that lot.

A GRAIN GROWING DISTRICT.

My district as a whole is a grain growing district. I have not paid much attention to thoroughbred stock. We fatten quite a bit of stock in our neighbourhood. My district is pretty well cleared up. The first settlers went in about forty-five years ago, and the land now is pretty well cleared of stumps as a general thing. It is about thirty years since I went on the lot I now occupy. I have paid more attention to grain growing than anything else.

THE SOIL—WATER.

The soil of the land of the farm I am on is a clay loam. The soil in the neighbourhood is not a stiff, but a loose, clay loam. There is some such land in my township, but only a small part of it is of that character. The country is rolling and very well watered. I have two living springs on one of my lots, and three on the other.

STANDING TIMBER.

The country is pretty well cleared up, but there is a great deal of bush. I think, on an average, that the proportion of bush to cleared land would run about twenty-five acres to the hundred. Our bush is all hardwood, we have no pine at all.

FORTY YEARS GRAIN GROWING.—NO REGULAR ROTATION.

It is over forty years since I went to that part of the country, and I have been growing grain there all the time. When the land was new we generally just cleared it up and raised wheat the first crop, and then seeded it down to grass, all but a small portion we kept for coarse grain. We always calculated to do enough clearing each year for wheat crops. I have not adopted any systematic rotation of crops. I don't think there is anyone of my acquaintance who practises any regular rotation, but they are beginning now to give some attention to it.

THE SYSTEM PURSUED.

We don't often have two crops of wheat off the same land in two successive years. We change with peas, roots, oats, etc. I take out this year's manure after harvest and put it on the poorest fields I have, and then I plough it down in the fall, and work it up in the spring again for a root crop; in the following year I will put in that field spring wheat, and afterwards seed it down.

SPRING WHEAT—FALL WHEAT.

It has been principally spring wheat that has been grown in my neighbourhood, and they have just started now to grow fall wheat. Quite a quantity of fall wheat has been sown in my neighbourhood this year, but as a general thing we have been growing spring wheat ever since we went there.

FALL WHEAT IMPROVING—SNOWFALL.

The reason that fall wheat was not grown so extensively was, that it was very apt
[Mr. Douglas.]

to get winter killed, until these last few winters, when it has stood very well. It stands the winters better now than it did ten years ago. As the country is more cleared now there is not such a heavy fall of snow now as there was then, it being the heavy snow that killed it.

FORMER EXPERIENCE WITH FALL WHEAT.

The people in my neighbourhood have not been draining their land to any great extent. I have drained some of mine. Nor is there more shelter this year than there was formerly. People tried fall wheat some years ago, but it was liable to getting winter-killed. When it stood the winter it was a fair crop. I tried it myself, but without success. The Clawson variety of fall wheat is the kind principally sown in the neighbourhood. I think the older land is more suitable for fall wheat; when we were clearing the new land it was given to rust. The new land didn't heave at all, but it was given to rust. I suppose the better cultivation now-a-days has something to do with fall wheat being grown more successfully now than it was. I am about seven miles from the Georgian Bay in a straight line from it. I don't know if the lake would have any influence in the growing of fall wheat. There was very little fall wheat winter killed this last year in our disiriet.

SPRING WHEAT FIRST-CLASS.

I suppose one reason for so much spring wheat being raised there is because it has been grown so successfully. A grain dealer recently told me that he has always sold the spring wheat of our district as first-class. The Red Chaff has been sown a great deal in our neighbourhood the last four years, but Russian White has done the best these last two years.

AVERAGE YIELD OF SPRING WHEAT.

Last year Russian White averaged between seventeen and eighteen bushels, and the Red Chaff averaged pretty near the same, but it will not be so much this year. Russian White will come up to the average this year, but Red Chaff will only average fourteen or fifteen. Russian White is better for straw

PREPARING LAND WITH A ROOT CROP

In preparing my land with a root crop to lay down grass I take the manure out in the fall and plough it under, and in the spring work it up as early as I can. I generally plough it twice in the spring. I gang-plough it, but not very deep, and then I plough it again with a gang-plough or single plough, ploughing about five or six inches deep. After that I drill it up and sow it.

ROOT CROPS.

I don't use any artificial manure, nor have I tried any. I have sown salt on the wheat. I have never grown any mangolds, but grow Swedish turnips. From 500 to 600 bushels per acre is my average crop of Swedish turnips. In cultivating roots we give them at least three horse hoeings, and we generally hoe them twice by hand. I think it is good to grow roots in connection with grain growing.

THISTLES.

We are troubled quite a bit with thistles. We are able to get them down to a certain extent by growing roots, but not entirely. We are thinking of adopting fallowing to check them.

TURNIPS AND CATTLE FEEDING.

With the turnips I generally fatten from six to seven head of catile. I don't think a root crop such as turnips is very exhaustive on the soil.

[Mr. Douglas.]

WHEAT AFTER TURNIPS—THE GRASSES.

We have never such a heavy crop of wheat after turnips as we will have the second year. After turnips we take a crop of spring wheat. We have not much trouble to get the grass to catch after roots. After laying down in grass we mow it for three years and then plough it up. I find the crop of hay in the second and third year about the same as the first year. I don't top dress it with anything the second or third year.

MANURING FOR ROOT CROP.

I generally put about twenty loads of manure to the acre for turnips. There is a ton and a quarter in one of these loads, and so that would be twenty-five or thirty tons to the acre. After these crops of hay I have scarcely ever pastured, as I always have had enough pasture from the new land.

PASTURE—BREAKING UP SOD—FALL PLOUGHING.

About two years' pasture is the general average in my neighbourhood. When the sod is broken up we generally put in wheat. Some put peas, but the general rule is to put wheat. When breaking up the sod I always find it best to plough in the fall. Last fall I broke up the sod, and sowed wheat this spring. It was the best crop altogether I had. I plough all my fields in the fall.

THE PEA CROP—PEAS AS FEED.

We grow considerable peas in my neighbourhood, the variety I have been growing for the last four years being the Prince Albert. That is a white pea, pretty large, between the large Marrowfat and the small pea. It has averaged twenty-five to thirty bushels to the acre. If we get the peas sown in time to get it cut up it proves useful, but if it can't be got in till late the straw gets spoiled. We feed all the peas on the place to cattle, sheep, and hogs. When we get the pea straw cut in time we feed it to the sheep.

VALUE OF PEA STRAW—SALT AS A MANURE.

I do not put so much value on a ton of pea straw as I would on a ton of timothy. I have not used salt extensively in my wheat; I haven't used it for three years back. My object in using the salt was to keep the wire worm away, and it also helps to stiffen the straw. It had that effect when I employed it.

SEEDING DOWN FOR PASTURE.

When I clear my land I always seed down at once and feed on that portion of the land. We generally cut it two or three years for hay and then pasture on it. It will stand for pasture ten or twelve years. We seed down with clover and timothy. We don't use a mixed lot of seed. There seems to be quite a bit of this natural white clover which comes up pretty thick. I don't turn my cattle into the bush at all. We have never been troubled with the pea weevil in our neighbourhood at all.

INTRODUCTION OF THOROUGHBREDS.

There have been some thoroughbred animals introduced into our district of late. There are five Shorthorn bulls within two and a half miles of my place. There has been from two to three in the neighbourhood for eight years or more. I was speaking to the owners of three of them recently and they told me that they had put the bulls to between 116 and 118 cows each during the season. No other breeds have been introduced except the Shorthorn.

IMPROVEMENT OF STOCK.

I noticed quite a marked improvement in the coming cattle of the district. There are two neighbours of mine who have one or two thoroughbred cows each.

[Mr. Douglas.]

LEICESTER SHEEP—A SOUTHDOWN CROSS.

Thoroughbred sheep are also being introduced, chiefly the Leicester, which is considered the best breed at the present time. I have been using the Leicesters for about twelve years. Before that I tried a cross with the Southdown. I put the Southdown to the common ewes. It seemed to do very well. I just used one for two years, and we thought they were getting too fine and small. I used common ewes for breeding purposes, and I am using a Leicester ram with those crosses. It was because there was a demand for long wool that made it desirable to have Leicesters. I find the Leicester is as hardy as the Southdown.

HARDINESS OF THE SOUTHDOWN.

The Southdown is a very hardy sheep, and fattens easier than the Leicester, and makes better mutton. The bellies of the Southdown are apt to get bare of wool. The Southdown will live on less food than the Leicester.

HEALTHINESS OF SHEEP.

I have not lost any sheep by death for a number of years. My sheep are not sickly in the spring. They are not troubled with any disease now, but five or six years ago I lost a few with the staggers. They seemed to be quite stupid. They are not troubled with any lung disease, and we have had nothing of the foot-rot among them.

COARSE GRAINS—CORN—GREEN FODDER.

We are working to get our farmers to keep more stock, and for that purpose we will grow rougher grain and root crops. They don't grow much corn in our neighbourhood, although I think corn would grow very well. What little we have tried grows well enough, and matures all right. I always grow a little green corn for the cows. I have no experience with any other kind of green fodder. Some have tried millet and vetches; but the corn seems to do best. We all grow considerable quantities of fruit. What I could say about fruit would be just about the same as Mr. Roy has said.

VALUE OF SHELTER ON A FARM—A SECOND GROWTH.

Although I have quite a bit of shelter on my farm it is not in very good shape. I fully appreciate the value of shelter on a farm, and I think it would be a great advantage to the country if we had more shelter than we have. On the north side of my farm I have a natural strip of wood that happened to grow up where the fence stood, and now there is a very nice row of trees part way along the fence. They have grown up without cultivation. I am in need of more shelter on my farm, and I think the crops would be a great deal better with it. Some of the farmers in my neighbourhood are beginning to find out the want of shade trees on their farms. I think they would plant trees and take care of them if the trees were given to them for nothing.

THE THISTLE ACT—HAY CROPS—COST OF HARVESTING.

The Thistle Act is a dead letter in our district, and never taken notice of. It is worth about 50 cents to cut an acre of hay, and I suppose 75 cents more would rake it up and haul it in; I am speaking of land where you could use a mower. In that estimate I don't include a man's board, which would be worth 50 cents. A man can cut from six to eight acres a day. They charge 50 cents an acre for cutting hay, and board for man and beast. The cost would be about \$2 an acre, including everything. There has been no general talk of introducing steam instead of horse power in our neighbourhood. There was one of our threshers spoke of introducing one, but the farmers don't encourage it. The only objection was that it wasn't safe. In my neighbourhood we don't thresh much until winter sets in—till the fall work is all done.

JOHN DOUGLAS.

[Mr. Douglas.]

MR. JAMES COCHRANE'S EVIDENCE.

JAMES COCHRANE, Kilsyth, Township of Derby, County of Grey, was called and examined.

He said:—My farm is 220 acres, 190 cleared. I have been engaged in farming since I was able to hold the plough. I cultivate grain.

A GOOD FALL WHEAT CROP—RUST

Winter wheat has always succeeded well with us, especially on new land; the only exceptions being when it rusted. There always has been a crop of straw, but in some cases there was not a crop of grain on account of the rust. Fall wheat succeeds well in our district. I live about 25 miles west of Mr. Douglas's place, on the base of the peninsula between Lake Huron and the Georgian Bay, about eight miles west of Owen Sound. The average yield per acre of winter wheat, where the land is well cultivated, will be, perhaps, 25 bushels. For two or three years back the average has been as much as that, with the exception of last year, when it was winter killed in some places. The Seneca is principally sown at the present time.

ROTATION OF CROPS.

Fall wheat is sown principally with us now, and it succeeds best immediately after sod. After peas we sow fall wheat, generally without manure. The average price of wheat has been about a dollar a bushel. After fall wheat I generally have a crop of oats, and after oats we put in roots, such as Swedish turnips. There are some mangolds and carrots put in, but the principal root crop is turnips, of which we grow a very fine crop with comparatively little trouble. After turnips we sow barley. Formerly we sowed wheat, but we found wheat did not do well after turnips, and now we seed down with barley. We manure with the roots, and not at all between the sod and the oats.

LIBERAL MANURING—PASTURE.

In manuring we generally put on about twenty loads to the acre. I suppose that would be about twenty-five tons. We occasionally do with sixteen loads to the acre, but the general rule is twenty. In some cases in seeding down we cut for one year and pasture two, and in other cases we cut two years and pasture one, altogether it remains three years in grass. This is an eight years rotation. I think my neighbours have generally followed the same course.

SUMMER FALLOW—OATS—MARKET.

We have not done any summer fallowing until lately. The summer fallowing just takes the place of the root crop in the rotation. The market for oats is above what we want for our own consumption. Oats are raised with us pretty extensively, and are exported to some extent. Owen Sound is our market. A great quantity of them in the fall of the year go up the lake to the mining country or to the lumber shanties. A gentleman in Owen Sound has a contract of 16,000 bushels to take up the lake, but will not be able to get that quantity in Owen Sound at this time of the year (October).

THE PEA CROP.

I can raise as much peas to the acre as oats. As high as sixty bushels of oats to the acre have been raised, but I have never been able to raise more than forty to forty-five [*Mr. Cochrane.*]

bushels. We have raised forty bushels of peas to the acre. It is not so profitable to raise oats as peas.

THE SOIL—CULTIVATION OF PEA CROP—A PEA WORM.

Peas are the most valuable crop we can raise. Our section of the country appears to be particularly well adapted for that grain. The soil of the neighbourhood is a clay loam with a mixture of rolling limestone. We are in the limestone region. Owen Sound is surrounded on three sides with a ridge of limestone rock. I grow the peas immediately after the sod. In sowing peas my instructions are to plough six by nine. Before sowing peas we don't harrow, no matter how rough the ploughing. When sowing upon the ploughed sod we harrow about four strokes, but it depends on the soil more or less. We give it a double stroke first, and then we cross it at angles with a single stroke, and then go back on it again; immediately afterwards we roll. The only enemy we have to the pea is the pea worm. It is white, and about a quarter of an inch or three-eighths long, with the head black. It is a worm; it is not the pea bug or weevil.

NEED FOR PRECAUTIONS AGAINST THE PEA BUG.

The pea bug ought to be looked after. Our section of country, to a large extent, depends on its pea crop.

INDIAN CORN.

Corn, although it succeeds well with us, takes a great deal more labour to cultivate than peas; they are our principal crop for fattening cattle and hogs. There have been a few people in our neighbourhood indiscreet enough to sow peas with bugs in them.

LEGISLATION CALLED FOR.

It would be a great boon to those sections of Ontario where the bug has not yet become generally known, if the Legislature would pass an Act to give Township Councils the power to pass by-laws to prevent, as far as possible, the spread of the pea bug. I think the measure would have to be to the effect that a person would be liable to a heavy penalty if he were convicted of sowing peas which he knew to be infected with the bug. To carry out such a measure I suppose it would be necessary to have inspectors. I think, however, if the attention of people were drawn to the evil they would be more careful. I don't think the persons who sowed them in our neighbourhood would have done so had they known the bug was such a terrible enemy. As far as the Township Council of Derby is concerned, I have not the slightest hesitation in saying that, if it were in their power, they would pass a by-law to prevent the sowing of peas infected with the bug. We harvest our peas with a scythe.

HARVESTING PEAS—PEA STRAW AS FEED.

I am aware there is a pea harvester, but I have not used one. It costs about \$1 per acre to cut peas. We thresh our peas with a flail. For threshing I pay a man five cents a bushel and board, or seven cents without board. I think the straw is far better when flailed than when threshed by machinery. Last winter I wintered thirty-one sheep on pea straw. I sold eight sheep for mutton, and one I had the local butchers would not take, because it was too fat. These hadn't eaten anything but pea straw. For feeding sheep I think it is as valuable as hay.

OAT MEAL—EXPORTATION.

I think the consumption of oat meal is increasing in the country. A good deal of it is exported from Owen Sound.

[Mr. Cochrane.]

SPRING WHEAT—TURNIPS.

It is the experience of all farmers in our neighbourhood that spring wheat does not do so well as formerly. We have not been in the habit of looking upon turnips as exhaustive to the soil, but our land is comparatively new, and they may be more exhaustive than we consider them.

A FARMERS' CLUB—MANURES—MANAGEMENT.

We formed what is known as a Farmers' Club some ten years ago in our neighbourhood, and a great deal of attention was paid to all farming matters, particularly that of manure. Manures are greatly sought after with us and hoarded as much as possible by the leading farmers. I am speaking simply of farm-yard manure and everything that can be turned into manure from the farm. In some instances we protect it, but generally not. One of my neighbours has adopted the plan of keeping it underneath his barn, piling it up and letting the liquid fall into a tank which is placed beneath. I consider manure rots better outside than it does inside. My plan is to form a heap in some convenient place to the stable and to put a layer of straw, then a layer of manure, another of straw, and so on, and cover it up a little to induce it to heat as quickly as possible.

FEEDING STOCK IN WINTER.

I feed from seven to ten cattle in winter. I use peas for that purpose and not corn. I have had no experience in feeding corn. We usually get the peas chopped. In feeding a three-year-old steer for the last two months, I feed ten to twelve pounds of pea meal a day; about a bushel of turnips, and all the hay he will eat. We depend on the peas for doing the fattening, and on the other food for keeping up the health and tone of the animal. The results of this kind of feeding have been satisfactory.

THE ROOT CROP GOOD.

I may mention that roots do well with us. Our township society has been in the habit of offering prizes for the best acre of turnips. Last year the acre which took the first prize produced 1,016 bushels, and the acre that took the second prize 1,000 bushels, and the acre that took the third was somewhere in the neighbourhood of 1,000 bushels. They calculated this quantity from weighing the turnips grown on one square rod, taking up that quantity in three different parts, and the average of these parts as the average of the field. I believe the man that got first prize had a hundred bushels more to the acre than they gave him credit for. With good culture I don't think there is any difficulty in raising 800 bushels to the acre in my neighbourhood, with farm-yard manure alone.

PLASTER—THE FLY—VARIETIES OF TURNIPS.

I sow plaster on my turnips a week or so after thinning. We are not troubled with the turnip fly much unless we sow very early. I never sow mine before the 15th of June, and I have never lost a crop by the fly. The varieties we sow are the old East Lothian, Sutton's Champion, and the King of Swedes.

VARIETIES OF OATS.

The variety of oats that yields the most with us is the old Black Main oat. The kind I have been using lately is the White Australian. I have not sown the Surprise oat lately, because they shelled a great deal in cutting, and they were thick in the skin. The best yielding oat I ever had was what was called the Spanish oat weighing with me forty-eight and a half pounds to the bushel, and producing seventy-five bushels to the acre.

[Mr. Cochrane.]

The great fault with them was that they broke down and cost too much to harvest. I only sowed them for two years.

CAUSE OF RUST—DESTRUCTIVE EFFECTS.

My farm is about seven miles in a straight line from the Georgian Bay. I attribute the rust to cold nights and damp days, followed by heat soon afterwards. If these extremes come when the wheat is about two weeks from ripening it is very destructive to the crop. My farm is about 200 feet above the lake.

SHEEP—LEICESTER AND COTSWOLD.

My sheep are a cross between Leicester and Cotswold, Cotswold rams upon Leicester ewe. My object in this cross was to give my sheep a better constitution. I have succeeded in getting a better constitution and in making them hardier. For the past six years I have not had a weak sheep in the flock, or one troubled with any disease. I have now a good, compact, stout sheep, improved both as to its size and as to the quantity of its wool. My shearlings averaged last year eight pounds each. I think they have arrived at a greater weight than they were before I started crossing with the Cotswold.

STOCK FARMING IN PLACE OF WHEAT CROPPING.

Wheat doesn't bear the same proportion to our average crop as it does where my friend Mr. Douglas lives. About one-third of our crop is wheat. There is a tendency now to pay more attention to live stock, and the subject is attracting a good deal of attention with us. It takes a little more capital to keep up a stock farm than a grain farm. Durhams are the only thoroughbreds in our township.

NECESSITY FOR A STOCK LAW.

I would like to call attention to a grievance that is beginning to attract attention, namely, the running at large of cattle. I would not be in favour of doing away with fences entirely; we couldn't do that, but I would be in favour of making each man take care of his own animals. It is not right that I should be compelled to fence my farm to keep out my neighbour's cattle. I don't think I should be put to the trouble and expense of keeping the animals of other people off my farm. I believe a better class of stock would be kept if cattle were prevented running at large.

LARGE YIELD OF PEAS.

Perhaps you may think I was not speaking with certainty when I told you I got as much peas as oats from my land. The fact is I sowed a five acre field with peas from which I sold 212 bushels, and I feel perfectly sure I have forty-five bushels to the acre this year from one field. I grow Second Early. It is a white pea. I sow about seven pecks to the acre. I am not aware that Golden Vine is sought after more than second early. Twenty-two bushels per acre was my best yield of Golden Vine.

TREE PLANTING—PROGRESS MADE—SILVER AND ROCK MAPLE.

I think in the matter of tree planting we are in advance of the rest of the county. Tree planting by the road-side and along lanes is becoming quite general. The neighbour who lives adjoining my place has planted out, I dare say, 1,000 shade trees. The trees planted by him were chiefly silver maple and rock maple. The first he planted was ten years ago, and they were planted fourteen feet apart. They now meet.

[Mr. Cochrane.]

METHOD OF PLANTING TREES.

It would be well to make known his mode of planting he has been so remarkably successful: He summer fallows the part where he intends to plant, and selects his trees from some place in the edge of the bush where a second growth is springing up, takes up the tree, cleans the root perfectly clean of earth, cuts a portion of the roots away, and cuts all the top off, simply leaving a bare pole ten feet high. He then plants near the surface, and packs the earth firmly around the roots of the tree, and mulches them. He plants on till the beginning of June; the proportion he has lost would not be more than one per cent. He makes it a point to take them all from the edge of the bush where there is a second growth.

COST OF TREE PLANTING.

After he has the ground prepared I don't think it would cost him much higher than \$5 for planting a hundred. I employed a man to plant trees for me. I gave him a dollar a day, and he dug holes and planted sixty a day, and made a very nice job of them. No trees in Owen Sound have the beautiful tops that those of my neighbour have. He has also planted Lombard poplars, soft maple, pine, cedar, spruce, and balsam. He has four rows of trees between the road and the house. The road in some places is completely shaded over. A great many are following his example.

FARM ACCOUNTS.

I generally keep accounts, but not a minute account. My accounts will show the profits for the last seventeen years, and I have kept a record daily of the weather, my work, and the results of the farm generally. I have an account to show what each variety of grain realizes, and I have it in such a way that I could put it before an accountant within twelve hours. In reckoning the accounts I charge so much a day for the feed of team and the capital they represent, the help employed to work them, manure used, etc.

COST OF GROWING FALL WHEAT.

The way we work an acre of fall wheat I would estimate the cost of growing a crop on it from \$10 to \$11. Although the manure is all put on in one year I distribute the expense connected with it over three years. The \$10 or \$11 is made up as follows: Ploughing the field, \$1.50; seed, \$2; harrowing and sowing, \$1; rent of land, \$3; harvesting and hauling, \$1.50; manure, \$1.50. We generally calculate manure to be worth 25 cents a load. Perhaps I have not calculated the manure high enough. I have made this estimate very carefully. In that estimate, however, I have made no allowance for fallowing. I would not charge any fallowing to the cost of producing the grain. Fallowing is cleaning the ground for all kinds of crops, and it is not fair to charge it to wheat alone, but to general account. Calculations of the cost of raising grain and cattle are generally too high; if they were correct a farmer could not live. Very frequently one hand is made to wash the other, so to speak. For example: if we charge the whole cost of the pea crop to the grain we have our sheep feed for nothing, and the same with manures. It is the calculations that are at fault.

JAMES COCHRANE.

PROFESSOR BUCKLAND'S EVIDENCE.

PROF. BUCKLAND gave evidence as follows :—

To Mr. Dryden.—I came out to Canada in 1847, at the invitation of the Government, of which Hon. Robert Baldwin was Premier, to occupy a position as Professor of Agriculture in what was then King's College. I found when I got here that there was considerable excitement and difference of opinion with regard to the Institution, and that the contemplated changes were not likely to be carried out for some time.

AGRICULTURE IN THE PROVINCE OF CANADA IN 1847.

I was advised, however, to go over the Province (both Upper and Lower Canada), and a considerable portion of the United States in order to make myself practically acquainted with the condition of Agriculture in these places. I spent a good deal of time in that way, going over the northern portion of the United States, from New England to the Mississippi, and there was not a county in this Province, and very few townships that were settled, which I did not have an opportunity of seeing.

A PRIMITIVE CONDITION.

Of course, at that early period, Ontario, as regards agriculture, was in a very primitive condition. A very large area of this Province, now laid out in farms and teeming with happy homesteads, was then an unbroken forest. I remember distinctly going through what was then called King's Bush or Queen's Bush, I hardly know which, in the County of Bruce, where there were thousands of acres of original forest.

A CHANGE IN SEVEN YEARS.

I went through the same section of country seven or eight years afterwards, and found it well settled, gravel roads, without toll-gates, in course of construction, and the people apparently thriving comfortably. I went through it several times afterwards, and, within a period of ten or twelve years from the time of my first visit, I was struck with the immense improvement that had taken place. Thriving orchards had arisen, one-half of most farms was chopped and burnt, and a good many acres were clear of stumps. Now, this is only an instance of the improvement that has occurred in other newer parts of the Province.

PROGRESS IN THE EASTERN AND OLDER DISTRICTS.

In the Eastern and more settled districts, agriculture had been introduced at an earlier period, and I did not observe those striking marks of change that I had witnessed in the west.

SIGNS OF SATISFACTORY PROGRESS.

I may say, generally, that on the whole, our agriculture, during the last quarter of a century, has been progressively, and, in some respects, satisfactorily advancing. The obvious improvements to be seen in the laying out of farms, in the fencing, in the character of the stock, in the homesteads, indicates healthy growth. I could give you many instances, some of them, perhaps, of rather a ludicrous character, in which improvement has taken place.

METHOD OF ACTION.

It was my practice to go around and make myself familiar with the farmers, to examine into the condition of the few Agricultural Societies which then existed, to introduce

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new vigour into them if possible, and to endeavour to create new ones. My method was a sort of free-and-easy one. I engaged in conversation with the farmers rather than gave them a studied address, and in this way I picked up information, as well as imparted it, suitable to the occasion.

THE BEST BREED TO STAND STARVATION.

I remember at a meeting of farmers in the east, being asked the question "What breed of cattle do you consider best to stand starvation?" I was rather taken aback at first, thinking the question a joke, but I soon found that what my interrogator wanted to know was, what breed of cattle I considered would best endure hard treatment during the long winters. At that time I do not think that county had a single pure-bred animal, either of cattle or sheep, within its borders. The best class of animals were the horses, and they were too light for general farm work, though well enough adapted to the buggy and saddle. Since then, a very much better class of horses, cattle, sheep and swine has been introduced into the county, as well as on the whole, a much better system of cultivation.

WOOLLEN MILL REFUSE.

I remember, too, being in a place where there was a woollen mill, the proprietor of which also carried on farming. In front and about the mill, lay a large quantity of waste refuse of many years accumulation, in which there was a large proportion of animal matter, and the proprietor was offering the same to any person who would take it away.

A NEW IDEA—EFFECT OF MANURE.

I told him that where I came from, people were in the habit of paying four or five pounds per ton for waste of a similar kind, and advised him to place it on his farm as manure. He did so, spreading it on a piece of land which had been somewhat run down, and the result was that in a field of wheat there was a sort of belt of most luxuriant growth where the waste had been spread, on which the yield was some thirty or forty per cent. greater than on the rest of the field. There has been no waste of that kind in that neighbourhood neglected since, and I mention these facts to show that although the growth of Canadian farming may not in many instances have been very fast, still it has been, on the whole, sure and healthy.

HOW PROGRESS HAS BEEN DEFECTIVE.

Mr. Dymond.—Would you kindly point out some respects in which our progress has been defective?

Mr. Buckland.—My impression is, and it has been strengthened particularly of late years, that we are farther behind in what may be called the art of culture, rotation of crops, and application of manures, than we are in the matter of live stock. The improvement of our live stock—I am speaking of the frontier counties more particularly—has gone on, I think, in a greater ratio of late years than the advance in the cultivation of the soil or the art of raising crops.

DEFICIENT CULTURE THE GREAT DEFECT.

Our great defect now is deficient culture, mechanically, as in ploughing and keeping the land clean, etc., and there is no doubt that with the large area of soil, we have hitherto had under imperfect cultivation for grain, we have not had an adequate supply of manure. In a great many instances the productive power of the soil has been running down, and I know personally of several places where it has got so low that it would require a very large outlay of capital and labour, and a large quantity of manure, to restore it to the same pitch of fertility that it occupied fifteen or twenty years ago.

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TROUBLESOME WEEDS.

I think, too, that one of the great practical difficulties that lies before us is the dealing, not perhaps so much with ordinary weeds like couch-grass, or things of that sort, but with what is usually termed the thistle. Unless some efficient means be promptly employed to check and, so far as possible, eradicate it, I believe that where it has obtained full hold of the ground, successful husbandry will soon become a matter of impracticability.

CANADIAN THISTLES.

To Mr. Malcolm.—I do not know so much about the extent of couch-grass, but I believe the thistle will progress more in the development of its roots in proportion to the food it gets. The dealing with thistles is no doubt a matter of difficulty, but within the last few years they have been increasing rapidly in many of the older sections of the Province, until now more than one-half of the soil in too many fields I believe to be occupied by them. Of course the food which the thistles extract from the soil is just so much nourishment taken away from the cultivated crops.

To Mr. Dymond.—There is no royal road to a cure for this pest. I remember the late Hon. Adam Ferguson was offered by a charlatan, for a good fee, an infallible method for eradicating thistles, which consisted in cutting them down with a scythe or a spud when in full flower, and that a little vitriol or sulphuric acid be poured upon the bruised stems, and so reaching the roots. It would take a great deal of sulphuric acid, I am afraid, to go over our fields in this fashion now-a-days.

WILD OATS—OX-EYE DAISY.

To Mr. Malcolm.—I have no special knowledge of wild oats, as a troublesome weed. It is as yet confined to a very few localities, I should hope, and the prevention of the spread of this evil requires the exercise of much vigilance and care.

To Mr. Wilson.—The ox-eye daisy in Europe, is always an indication of a poor neglected soil, and it is not difficult to get rid of it by culture and manuring.

WILD MUSTARD—TREATMENT.

The wild mustard is more difficult to manage, but I should recommend that where a person has a field overrun with this weed to allow it to get into full flower and then mow it, not taking any crop off the field that year. But where wild mustard seed has got into the soil it will frequently reappear, sometimes grow very thick after it had apparently been got rid of. Deep ploughing takes it under, and deeper ploughing brings it up again. I do not consider it so dangerous a weed as the thistle. I am not aware how long the seed will remain under ground without losing its vitality. I have known it to be brought up from a depth of three or four feet, without losing its vitality. If buried sufficiently deep to preserve it from the influence of moisture or the air, I should say it might continue under ground for centuries, and still germinate if brought to the surface under favourable conditions. I think the only cure for rag-weed is to pull it out.

THE CANADIAN THISTLE AN EXOTIC.

With regard to the thistle, I have seen in England permanent pastures completely overrun with it, and the only way to eradicate the nuisance was found to be spudding it two or three times a year. We call it the "Canadian" thistle, but it was probably imported in grain from Europe, and seems to be identical with the ordinary farm thistle of England. If spudded as soon as the leaves are developed, next year the plant becomes weaker, and in the following year it can be nearly eradicated—that is, on pasture land. It is only by deep ploughing and getting at the roots, that the nuisance can be removed

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on cultivated land. I do not know that any machinery beyond the hoe or grubber can aid us. On pasture lands it may be killed, as I have said, by depriving it of its leaves, but on lands which are cultivated for grain, a different system has to be adopted.

GRAIN RAISING AND BEEF PRODUCTION.

To Mr. Brown.—I think, we in Ontario, as well as our brother farmers in the old country, are undergoing considerable change with regard to the raising of grain as compared with the raising of beef and mutton, for the purpose of supplying the English market. If the great North-West, both on the American and Canadian sides of the boundary line, become settled, as it promises to do, and means of cheap transport are provided, an immense amount of virgin land, admirably adapted to the growth of grain, will be brought under cultivation, and I think we in Ontario and Quebec, as well as the farmers of the Eastern Provinces and the Eastern States, will feel the competition in a similar way, to that which the British farmer is already doing. Much, of course, will depend upon the relative prices of grain and meat. It seems to me, however, that it will be far more profitable for the Ontario farmer to grow less grain than he has been accustomed to do, and to raise more stock. We know that in the New England States and Eastern Provinces, of late years, they have produced very little wheat, and have had to import it from the west.

ONTARIO SUITED FOR MIXED HUSBANDRY.

But I do not consider that we shall ever be great importers of wheat in Ontario. Our soil and climate are alike suited to the raising of grain and pasturing on a large scale, and it has been found all over the world, that wherever the conditions are at all suitable, the mixed system of husbandry, viz, the growing of grain and the breeding of stock, is the most certain and profitable. It keeps up the stamina of the soil, and I have long been of the opinion that it would be wise for the Ontario farmer to cultivate less land for grain, and to use the remainder for the purpose of pasturing cattle and sheep.

ECONOMY OF LAND BY GOOD FARMING.

It would be quite possible to grow upon twenty acres, well cultivated, as much wheat or other grain, as by a negligent and imperfect manner of treating the soil, we now grow upon thirty. So that I do not despair of our being able to meet successfully the altered state of things, which in all probability, the future will bring, because I think by better cultivation we can grow as much grain upon a less area, and have the remainder of the land upon which to raise stock, thus giving us the opportunity to increase the number, and improve the quality of the latter.

OPINION AS TO DRAINAGE.

To Mr. Dryden.—I do not think it is necessary to attempt any refined system of draining—what in England would be called thorough drainage—in this country, neither do I think it would generally pay. In England, and I have no doubt it has proved profitable there, the system is to run drains up and down a field at uniform distances, with little reference to what parts may be specially wet, or comparatively dry, but in this country I think we should first aid nature in draining. Nature is the first drainer, and we should avail ourselves of the means she places within our reach, such as clearing out creeks, and facilitating the natural egress of water by surface furrows and deep ditches.

VALUE OF DRAINAGE TO A FARMER.

To Mr. Dymond.—The value of drainage to a farm depends much upon the capability of the soil, and its marketable value. Good soils that are wet repay expenditure for drainage much more rapidly than moderate or poor soils in a similar condition. I cer-

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tainly would not recommend our farmers to go into any stereotyped system of drainage, such as that in vogue in many parts of the old country, both because they have not the requisite capital, and because I do not think the land in general requires it. I do not mean that if we drain, even what may be regarded as a dry field, we shall not improve it, but that the idea that we shall make it injuriously drier, is fallacious.

DRAINAGE PROVIDING MOISTURE.

I remember in clearing up the old University Park, in Toronto, where the soil in many places was very wet, we had a number of drains made, and the ground afterwards sown with grass seed, and wherever these drains were put, through dry as well as wet ground, the earth having been moved and the moisture getting in when the grass seed was sown, little belts of green might afterwards be seen all through the driest summers for many years, indicating that we need not fear over-draining, so far as bringing the land into a good state for the sustentation of crops is concerned. There is, of course, a limit beyond which expenditure cannot be profitably carried.

DEPTH OF DRAINS.

To Mr. Malcolm.—The depth of drains should vary according to the nature of the soil, and the source of wetness. In Canada, where frosts often deeply affect the ground, probably three feet would be about the proper depth, and on very wet, porous land perhaps deeper. In England when we commenced draining on a large scale more than half a century ago, the orthodox depth was about thirty inches, but that was soon found too shallow, and we rushed to the other extreme, and put in drains four or five feet deep, which was found exceedingly expensive and did not pay. In Canada, where the water to be taken away percolates into the ground from the surface, I would not put down any drains less than three feet deep. Where the water comes from a spring, the best way is of course to tap the spring to the requisite depth in the most economical manner.

TILE DRAINS BEST—BRUSHWOOD.

Where access can be had to potteries, the best material to put into drains is the tile or pipe; it will be found cheapest in the end and most to be depended upon. But it is surprising how long even brushwood drains will endure, and what good they will do in certain soils. In England I was personally aware of a case where drains kept open and did good service for thirty years, and where nothing had been used in laying them down but heather. The heather would of course decompose in a few years, and yet the drains remain open. The soil was a stiff stubborn clay, and the field had been kept in pasture all the time. If it had been ploughed, I doubt whether the drains would have lasted so long.

BRICK DRAINS.

Many years ago we had to lay drains in University Park and could obtain no pipes or tiles, or anything of that kind, so we used ordinary bricks, hollowed out, placing one over the other, but wherever there was shifting ground or quicksands, though the bricks were laid with great care, in two or three years the drains became useless.

BOX DRAINS.

If you have a box drain, so long as the joints keep tight, and do not allow the sand to get in, of course the drain will continue in good order, but where quicksands exist it requires the greatest care to keep them out of the drain. Wherever water will go, these impalpable particles will go too, and by subsiding obstruct the current.

PRECAUTIONS IN THE CASE OF QUICKSANDS.

In light soils, especially when quicksand occurs, the joints of the pipes should be
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secured by what are called collars, but in ordinary cases tough sod laid over with care will answer the purpose. In tenacious clays, particularly, it will materially improve the function of drains, in rapidly carrying off superfluous water, to cover the tiles with porous earth, gravel, spray, or bushes, a foot in thickness, and the necessity cannot be too strongly urged of systematically examining and keeping open their outlets, the neglect of which will be certainly disastrous.

UNIFORMITY OF FALL.

In England, of course the winters are wet, the ground often soft, and draining can then be carried on, but here we have not the same opportunities during that season. If the land is wet when the drain is being dug, of course you can see the flow of the water and a spirit level may be unnecessary, otherwise that useful instrument should always be brought into requisition. Great care should be taken to have uniformity of fall. When draining was first gone into in England, hundreds of miles of drains were rendered worthless, from want of attention to this point. If the bottom of the drain is not uniform, there is a tendency in the lower portions to silt up, and consequently to impair the continuity of the drain.

DRAINING IN UNEVEN GROUND.

Of course I do not mean that, in a large field, where the surface is uneven, the depth of the drain should be uniform. I think a drain three feet or three feet and a half is sufficiently deep, even in the higher parts of the field, but I am not an advocate of too great an inclination. Water does not require to run too rapidly through a drain; it will be apt to get out at the joints and work out a side channel. Unless the bottom of the drain is uniform, if anything happens, say certain parts get silted up, it produces a series of temporary springs, and the drain becomes a nuisance instead of a benefit.

EFFECT OF UNEVENNESS IN DRAINS.

Water that is in motion holds the particles of mud in mechanical suspension, and as soon as it comes to a place where the inclination is less than previously, there is a danger of the mud being deposited and the drain becoming obstructed and useless. I think it quite impossible to lay down any system of the allocation of drains that will meet with the varying conditions of soil and surface. Unless a field were personally examined, both as to its surface and as to the source of wetness, it would not be possible to say how the drains should be dug in the most efficient and economical manner.

CARE AS TO OUTLET NECESSARY.

The fact that too many of the drains laid down by the farmers of this country become of little or no use after a few years, may be accounted for by neglect of the outlets. I observed a farm that had been pretty well under-drained a dozen years ago, but from neglect of the outlets several of the drains had silted up, and a series of little springs had been formed in parts of the fields after heavy rains.

MOLE DRAINING.

We found this a great objection to mole draining in the old country many years ago. This system was only adapted to wet clay subsoils. In order to make a mole drain furrows were drawn with a suitable plough, on the share point of which was fixed a piece of iron shaped like the animal mole, thus pressing out the clay on all sides, and leaving an aperture for the discharge of water. The difficulty with this kind of drain was that it was too shallow and frequently falling in, and in a great many instances, where not properly executed, it did in a little while more harm than good. Drains of this character, on account of their shallowness, would be soon destroyed by the action of frost in this country.

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EFFECT OF SUBSOILING.

To Mr. Dymond.—It can be laid down as a rule, upheld by all the experience I have ever had, and by all that I know on the matter, that subsoiling or deep ploughing on land that requires draining does no good, but rather harm. The proper method to follow is to drain the land one year, and the next to cultivate it deeper, or subsoil it. I have had a good deal of experience in the cold, wet, clays of England, and that is a rule I have universally found beneficial.

CANADIAN SUBSOILING.

Where land has been cultivated in a shallow and imperfect manner, it has been found safer and more beneficial to adopt deeper cultivation by degrees, and much in this respect will depend on the depth of the soil and the character of the subsoil. I have seen great losses sustained, particularly in the old country, from the neglect of this precaution. As a rule, cultivation in Canada has been and still is, too shallow, but I have observed of late years, among our advancing farmers, a tendency to plough deeper, to the depth in some instances of eight or nine inches, the work executed in a superior manner, attended by satisfactory results. The subsoil plough is beginning to attract attention, and its operation in dry land has, I believe, been generally beneficial.

To Mr. Dryden.—By subsoiling, I do not mean trenching or bringing the subsoil to the surface, but merely loosening it.

EXHAUSTED SOILS.

With regard to the exhaustion of soils, I would say that if a soil is really and absolutely exhausted, that is, if it contains scarcely any of the mineral constituents which plants require, in a new country where land is cheap, and produce low, it would be a very unprofitable business to attempt to restore it. Such a soil would be worthless as a gift.

EXHAUSTION OFTEN ONLY PARTIAL.

Fortunately, exhaustion in most cases is only relative, and admits of a great number of degrees. A great deal of the land said to be worn out and exhausted, is only exhausted perhaps to the depth of three or four inches, and you will generally find that land of this kind has been cultivated in a very shallow way, and that the subsoil may contain a storehouse of plant food which has scarcely been reached at all.

REMEDIAL MEASURES.

In cases of this kind, deeper ploughing, judicious manuring, and care not to over-crop, will in time bring the soil back to its original fertility. But where land has become thoroughly exhausted, unless it possesses more than mere farming value, it seems almost useless to attempt to make restoration a profitable operation.

WASTE OF BARN-YARD MANURE.

As to manures, the conclusion I arrived at when in the habit of going through the country in past years, was that if the absolute naked truth could be got at in any way, it would be found that the manurial power of our barn-yard dung from exposure and want of care loses, at least, 25 or 30 per cent. of its value. If we look at the worth of the manure thus wasted, its loss cannot be regarded as other than a national calamity. I would say, however, that during the long period that I have known this country, there has been of late considerable improvement among many of our farmers in this respect.

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LOSS OF LIQUID MANURE.

Somehow or other, a large proportion of our barn-yards are placed near creeks or small bodies of water—presumably for convenience in watering the stock—and very much of the liquid manure, the most valuable part, escapes into these creeks or bodies of water, and so is lost. If our barn-yard manure were properly cared for, and not exposed to the drenching of untroughed roofs, it would be much more valuable than it is now; it would be worth thousands, perhaps millions, of dollars more than under its present treatment. It should be kept under cover, if possible, and a very little attention would prevent a great deal of the present waste, not only in quantity, but particularly in quality.

TREATMENT OF MANURE.

To Mr. Dymond.—I would recommend that where black muck soil, or any vegetable porous matter, can be readily got, a bed of such material be formed as a foundation, and the dung heap be placed upon it, after the former has been exposed to the drying influence of the sun and air. The heap should also be surrounded with a wall two or three feet high, and with this dry absorbent substance, which is also a manure in itself, the value of the manure heap would be much enhanced.

LAND PLASTER AS AN ABSORBENT.

Land plaster is a very valuable substance, and ought to be in every barn-yard, not only for the purpose of absorbing the liquid portion of manure, but also because it has a tendency to fix the volatile alkali, which is injurious to animals in confined structures. The ammonia that escapes from a close, ill-ventilated, stable during the year is very hurtful to the eyes of horses, and to their general health, and by sprinkling upon the floor a little sulphate of lime or plaster, a great deal of this vapour would be converted into sulphate of ammonia, which does not readily decompose or evaporate, and is in itself a valuable manure. The same remark would apply to the manure heap.

MAKING A COMPOST.

I have always advocated the composting of our barn-yard manure to a considerable extent, and as you are building your heap to sprinkle upon it a little sulphate of lime, or common salt, which I think would be more useful in that way than if applied by itself.

LOSS OF THE MOST VALUABLE PORTION.

I do not think that barn-yard manure loses so much of its power by exposure, during the winter as many people imagine, for decomposition in a cold, dry, atmosphere takes place very slowly, and sometimes not at all; but the trouble is that when the frost breaks up and the spring rain come it gets thoroughly drenched and the most valuable portion of it—the salts—become solvent and are carried away. Therefore I should always, where it can be carried out, prefer to plough it in rather than leave it exposed on the fields during winter. This thought also occurs to me.

FERMENTATION DESTRUCTIVE TO SEEDS.

There is no doubt that the seeds of a great many weeds are carried out on to the farm with barn-yard manure. How far fermentation of manure would destroy these seeds I cannot positively say, but I have reason to think that it would destroy a large proportion of them, and for this reason I would prefer fermented to green manure. But these rules are somewhat general in their character, and it requires skill in farming and knowledge in practice to put them into efficient operation under varying conditions.

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FORESTRY AN IMPORTANT SUBJECT.

I will not take up the time of the Commission by offering any remarks on the subject of forestry, further than to say that I believe the preservation of our forests to be a matter worthy of the gravest consideration, both of our Legislature and of practical men. During my residence in Ontario I have seen forests entirely destroyed; farms of 200 or 300 acres, may now be found, having scarcely sufficient wood for domestic purposes.

KEEP UP THE LAND AND PRESERVE THE TIMBER.

I think that care should be taken by a man who has a farm to clear up, not only to adopt a system of cultivation by which he can keep up its productive powers—for I do not call that good farming, however much money may be made or large crops be grown, which leaves the land eventually in a deteriorated condition—but also to be careful to leave a portion of the woods on the north and west sides of the farm, which would not only serve as a shelter to animals, but increase the productiveness of the land.

REPLANTING—SECOND GROWTH.

I am aware that we cannot in general leave the old forest trees, but if we were to clear out at the north and west sides of the farm the decayed trees, and replant with young ones, and encourage the second growth, my impression is—and I have seen it done and can therefore speak from observation—that great good might be effected.

WIND-BREAKS—SHADE BELTS—EVERGREENS.

If a little more attention were paid by our well-to-do farmers in planting small shrubberies and ornamenting and sheltering their grounds and homesteads by deciduous and evergreen trees, it would add greatly to the beauty of our landscapes, and, I think, would be highly conducive to the health and comfort, both of the inmates of the house, and of the domesticated animals.

THE ONLY REMEDY.

To Mr. Dryden.—When the old trees have been indiscriminately cut down, and the forest converted into arable land, I really see no remedy but replanting on a limited scale, and I think it might be profitably done if trees were planted with a view to economic purposes as well as shelter. Besides it is contended that the wholesale destruction of our native forest must have an injurious effect on climate, by producing extremes unfavourable to health and the products of the soil.

RAISING TREES FROM SECOND GROWTH.

To Mr. Dymond.—The question of raising trees from second growth is a practical one, and I am aware of at least one instance in which the plan was successful. About thirty years ago I was staying a few days with a farmer in Prince Edward County, who was clearing up eight or ten acres of bush and burning it. Three or four acres were covered with second growth maple, and I persuaded him to leave that for the purposes of a sugar bush. He did so, and now it is one of the most beautiful little sugar bushes you can find in Ontario. This, of course, could only be done where the maple is the predominant wood.

AGRICULTURAL EDUCATION.

Agricultural education is the next topic on which I will say a few words. I am very happy to have lived to an age when a system of agricultural education has not only been inaugurated, but I believe, firmly established in this Province.

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THIRTY-THREE YEARS AGO.

I came out here with a view to the promotion of agricultural education, but on my arrival I found the country was not ripe for it, and that the only chance to give it status here was the establishment of a Chair of Agriculture in the University. It was long time before that could be done, owing to the dissensions and divisions as to what should be done with King's College. At that time there was only one Agricultural College in England, recently established in Cirencester, though there may have been a few in Germany and other parts of Europe.

AGRICULTURAL EDUCATION IN ENGLAND.

The great objection to the establishment of agricultural colleges in England was that the people there had a better system of agriculture, and the produce per acre was far greater than in those countries where these schools were inaugurated, and this conviction no doubt operated against the introduction of systematic agricultural education in the Mother Country to a great extent. I had three hundred acres offered me just outside the boundary of the city of Toronto at a very low rate, which I had some thoughts of buying and cultivating in a scientific manner, in accordance with modern practices of my own responsibility, the loss or profit to be borne or enjoyed by myself. If the scheme had been carried out we should have had a system of practical instruction in connection with the theoretical teaching in the University, and my impression is that we can give no complete agricultural education apart from practice.

INSTRUCTION MUST BE PRACTICAL.

I do not mean to say that instruction in schools or colleges may not be useful; I have no doubt it is, but to be thorough, we must combine science with practice, and I am very glad to say that we have now an institution in this Province which I have no doubt the country will sustain, the equal of anything of the kind on this continent, and which, liberally supported, I believe will be surpassed by no institution of an analogous character either in Europe or America.

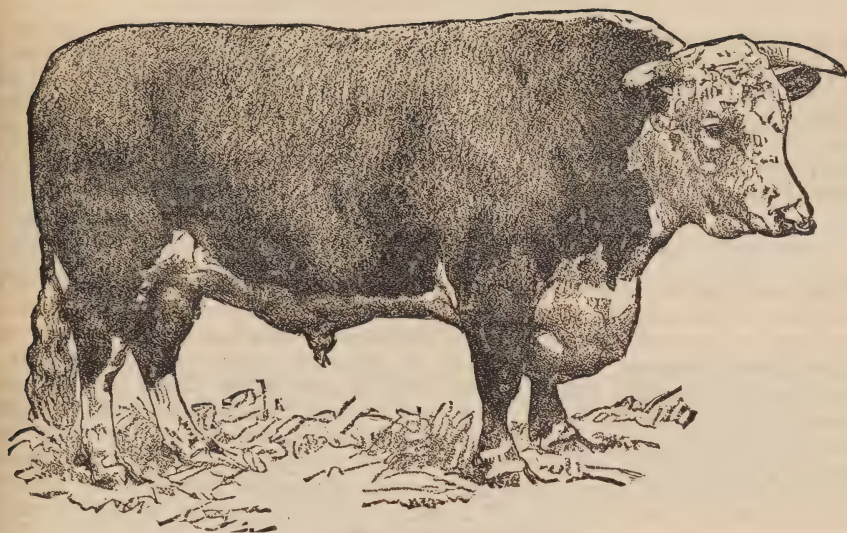
LIBERAL AID NECESSARY.

What is wanted is that the Legislature should grant more liberal supplies for its maintenance, especially with a view to extend and perfect its scientific teaching and the laboratory appliances. We have also a School of Practical Science in Toronto, which likewise requires additional aid to enable it to carry on its work in the most efficient manner. A necessary amount of additional apparatus and appliances for prosecuting original research, and for illustrating the practical application of scientific principles to the various pursuits of life might be readily procured by a grant of a few thousand dollars. Then we, as Canadians, would be placed upon an equal footing with our American neighbours in the prosecution of science and the enlargement of its boundaries.

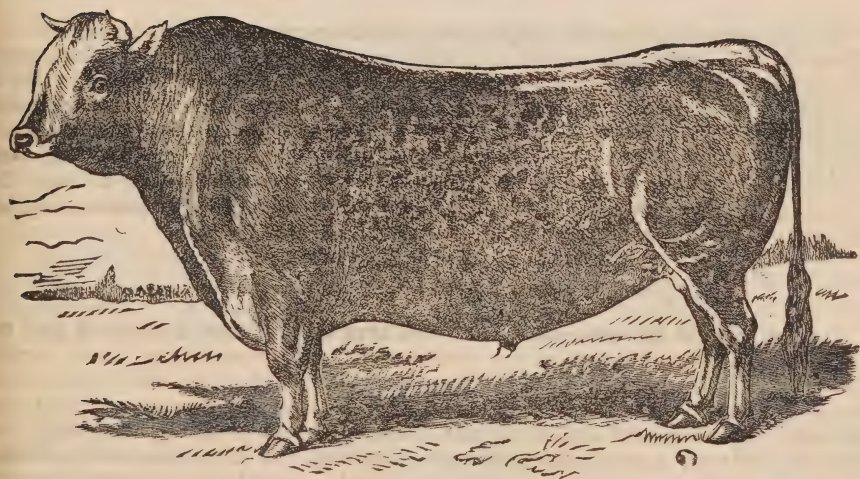
ORNAMENTAL PLANTING ON SCHOOL LOTS.

Another thought has occurred to me. We have now a large number of good stone and brick school-houses throughout the country, but as a general thing, their surroundings are by no means inviting. I think that not only should every school-house be surrounded by a decent fence, but that it should have attached to it in country places a small ornamental plantation, and a piece of land for the purpose of raising flowers and plants of various kinds for purposes of illustrative teaching. I think that surroundings of such a kind would not only foster in the young mind a taste for the beautiful in nature but that they would help to create a liking for agricultural and horticultural pursuits that might be followed out in after life.

[Professor Buckland.]



HEREFORD BULL.



JERSEY BULL.

A GENERAL AGRICULTURAL EDUCATION.

I would in this way introduce the germ of agricultural education into our public schools. I am very well aware of the danger now-a-days, of attempting to teach too much; there is that to be looked at. There must be a greater division of labour, and we must not only have better teachers, and in order to do that we must pay them better. Our trouble and outlay for these purposes would be repaid in a *dollar* sense and doubly repaid in refining and improving the tastes and the habits of our children. I consider one of the great advantages to be gained at the College at Guelph, besides the scientific and practical knowledge obtained there, to be the means which it places within the reach of the pupils of going on to higher degrees of knowledge, and the elevating tendency which it will have upon their tastes and character in after life.

AGRICULTURAL SOCIETIES AND SHOWS.

To Mr. Dryden.—The next and last subject upon which the Commission requested my views, is that of Agricultural Societies and Exhibitions, grants to the same, Provincial Bureau of Agriculture, etc. Now these are complex and involved questions, and time will only admit of the briefest allusion to them. I can, however, state in a few words, my honest convictions. I should be extremely sorry to see the Commission take up these very complicated matters at this, its last meeting, with a view to anything like legislation by the Government during the coming session of the Legislature.

THE PROVINCIAL ASSOCIATION.

With regard to the Provincial Association, there is a feeling getting up against it. How far this feeling is justified by the facts I do not at present presume to say, but there is always a danger when any excitement gets up of its going too far, and that people will be led more by sentiment and prejudice than by enlightened conviction. I think we are probably moving towards a crisis when the whole question of these societies, Provincial, County and Township, will have to be gone into.

DELIBERATE CONSIDERATION NECESSARY.

It ought to be gone into when the time arrives in a proper spirit, and nothing should be done hastily, or without ascertaining fully the views and wishes of the farmers and manufacturers of the country. I have no reason to think that the Government would undertake to make momentous changes of any sort on its own responsibility, and I think it would be unwise for it to do so. I hope, therefore, that whatever is done in these respects in future will be done with deliberation, and that we shall have a chance of getting something better than we have already got. Having been connected with the Provincial Association since its very inception, I may state my conviction that it has done good and honest work. The time may be come when it can be improved, and I say at once, let it be improved, and the other societies too. But I hope that no crude measures may be brought forward in any case, and I think this Commission, now that its term of sitting has drawn to a close, has acted very wisely in refraining from going into the subject, seeing that it was impossible for it to do so thoroughly at the present time.

THE GOOD DONE.

With all the imperfections that may attach to the Provincial and other Agricultural Societies, no one, I think, capable of forming a deliberate opinion on the subject, but must admit that they have done incalculable good, not only to the Agricultural, but also to the other industries of the Province.

GEO. BUCKLAND.

[*Professor Buckland.*]

PROFESSOR BROWN'S EVIDENCE.

WILLIAM BROWN, Professor of Agriculture and Farm Superintendent of the Ontario Agricultural College, and a member of the Commission, examined.

VARIETIES OF FALL AND SPRING WHEAT.

To Mr. Dryden.—The varieties of winter wheat grown in my district at present, are Clawson, Scott, Gold Medal, Red Chaff, and Fultz. The variety of spring wheat is White Russian, which is doing remarkably well. When I speak of my district, I speak of one 900 feet above the level of Lake Ontario, and I judge that what does well there would do well in most other parts of the Province. The Lost Nation is so similar in every respect to the White Russian that I believe they are practically the same.

CAUSES OF FAILURE OF WHEAT CROP.

The principal causes of the failure of the wheat crop which have come under my experience, have been, the Hessian fly, the wire worm, the joint worm, and the midge, along with rust to a very large extent, and a weather blight, which at times comes over our spring wheat particularly, in June or the beginning of July. I am not prepared to say what that blight is. Another cause of failure in fall wheat is winter-killing.

CAUSES OF SUCCESS.

The principal cause of success, I may say generally, is good farming, but in detail, I think the causes are, strict attention to rotation in cropping; the judicious use of well-made farmyard manure, the cultivation of roots, and abundant shelter; but I am afraid the exercise of these causes of success will not prevent the operation of the causes of failure which I have mentioned.

SALT AS AN ANTIDOTE—INCREASED YIELD OF WHEAT.

I am not prepared to say definitely whether the use of salt has proved to be an antidote to any of the evils named. I am of opinion that the yield of wheat is steadily on the increase in the older portions of the Province, largely by reason of more root growing and cattle raising.

FOREST PROTECTION TO FALL WHEAT.

I have not had much personal experience with respect to the protection afforded by forests to fall wheat; but I believe that, in the northern portion of the Province, fall wheat is more successful than in the southern portions, simply because of the greater protection afforded by a greater bush area. The fact cannot be impressed too strongly upon our farmers that the country has been over-cleared of forest.

WHEAT ON CLOVER SOD.

I have tried the experiment of turning over a clover sod for a seed bed for fall wheat but with failure. Not only is there danger of having a subsoil which is too open in certain seasons, but such a seed bed renders the plant more liable to insect attack.

DECIDED VIEWS—A ROTATION FOR THE WHOLE PROVINCE.

On the treatment of land in preparing it for a spring or fall wheat crop, I hold rather decided views. I have adopted a rotation of crops, which I think is applicable to the whole Province; and although I have not been very successful in raising fall wheat, by reason of our high elevation and greater exposure to the atmosphere, in spring wheat, which does not require the same amount of protection, my success has been very marked indeed.

[*Professor Brown.*]

ROTATION AT THE GUELPH FARM.

The rotation we follow on the farm, after breaking up the sod, is:—1st, peas; 2nd fall wheat, spring wheat, or oats, according to condition of soil; 3rd, roots, which should bear the manure for the whole rotation; 4th, barley or wheat, seeded with grasses and clovers; 5th hay; 6th, hay or pasture, according to conditions; and, 7th year, pasture.

THE AMOUNT OF MANURE USED.

The amount of manure per acre, is fifteen loads of barn-yard manure, 300 lbs. of bone dust, 250 lbs. of salt, 200 lbs. of gypsum, and 300 lbs. of mineral superphosphate. It has been our regular practice to use these quantities for the last five years—all mixed together and applied at one time.

CALCULATIONS AS TO COST OF CROPS.

In speaking of the cost of producing certain crops under a given system of rotation, during a series of years, we require careful figuring, and a sound handling of the facts that guide the science and practice of our profession, especially with reference to the conduct of plants and their food as regulated by weather, soil, and management.

AN UNSOUND METHOD.

There can be no more unsound method of arriving at this than the common one of debiting cultivation, seed, manuring, and the cost of harvesting and marketing, and then crediting the realized quantity of crop.

CALCULATIONS AS TO CROPS ON VIRGIN SOIL.

The only case in which such a method can be reasonably applied is that of cropping upon virgin land which is insensibly impoverished during a number of years, and which requires no form of manuring; but even in this example, the economist must recognize the fact that the soil does diminish in power.

DEALING WITH OLD LAND.

We have, however, to deal with land that has been regularly cultivated for the past twenty years at least—land, therefore, now regularly yoked to systematic rotation of crops, and supposed to be representative of the older cultivated lands of Ontario, both as regards physical condition, natural richness, and modes of cultivation. The first thing, therefore, to be considered is the rotation, and the next, the average quantity of crops from a number of fields during a period of years.

THE ACTUAL PRODUCE UNDER THE ROTATION.

I have given the rotation, and now I wish to record the actual produce under that rotation for the last five years, from 1876 to 1880 inclusive. The average produce per acre has been as follows:—

Peas.....	30 Bushels.
Spring Wheat.....	17 “
Fall Wheat.....	35 “
Oats.....	41 “
Mangolds.....	725 “
Turnips.....	614 “
Carrots.....	540 “
Potatoes.....	165 “
Barley.....	24 “

Hay..... One ton and four-fifths of a ton, weighed when it is taken in.

[Professor Brown.]

THE MANURE ALL APPLIED TO ROOT CROP.

All the manure allowed for the seven years, is applied to the root crop, and should be sufficient to supply all that is needed for the various crops of the rotation.

APPORTIONMENT TO RESPECTIVE CROPS.

It is plain, therefore, that the cost of manure must not be charged to the roots alone, but must be apportioned to what experiment has shown to be the average feeding volume of each, proportionate to time, soil, season, and management thereof.

ANY INCREASED VALUE OF LAND TO BE ESTIMATED.

If there be any residue of manurial value, or what may be called increased value of land from such management on the expiration of the seventh year—the same should be considered in the future balance sheet, either in taking inventory of capital account, the original investment in the purchase of the land, or increasing the credit of the coming succession of crops.

SUPERIOR BRAIN WORK.

I am not prepared to allow directly for superior brain work in the management of a farm, because I am not prepared to leave the management of a farm to brains alone; so if it should be argued that any of these crops should be debited to such superior management, I beg to note that the general result will embrace this in the septennial balance sheet by the inventory indicated.

COST OF THE WORK.

Our work is now, therefore, very simple, and I will now give you the cost of the work on the various crops:—

Common ploughing of stubble.....	\$1 50	per acre.
Common ploughing of sod.....	2 00	"
Gang-ploughing.....	0 75	"
Harrowing, once.....	0 20	"
Cultivating, once (grubbing).....	1 00	"
Rolling, once.....	0 20	"
Horse hoeing, once.....	0 50	"
Hand hoeing, once, taking an average.....	2 25	"
Drilling, with single plough.....	0 75	"
Root sowing, with drill.....	0 35	"
Grain sowing, with drill.....	0 25	"
Hauling and spreading farm-yard manure, fifteen loads....	3 75	"
Sowing artificial manures.....	0 25	"
Harvesting wheat, oats, or barley, including mowing, binding, shocking, and hauling.....	2 25	"
Harvesting peas, pulling and hauling.....	1 75	"
Topping, harrowing, and hauling mangolds or turnips....	8 50	"
Pulling, topping, and hauling carrots.....	8 00	"
Ploughing, gathering, and hauling potatoes.....	5 50	"

COST OF PRODUCING EACH CROP.

I shall now give you, from actual experience, the cost of producing the different kinds of crops, together with the amount they realize, showing the profit derived from each. Beginning with

[*Professor Brown.*]

Roots.

Fall ploughing once, spring ploughing with gang once, grubbing twice, harrowing twice, and rolling twice, costs.	\$4 05	per acre.
Manure (farmyard), fifteen loads	\$19 50	"
300 lbs. of bone dust	4 00	"
250 lbs. of salt	0 50	"
200 lbs. of gypsum	0 50	"
300 lbs. of superphosphate	4 80	"
Cost of distributing manures	4 00	"
Altogether for manure	33 30	"
Horse hoeing twice, hand hoeing twice, drilling, cost of seed and seeding, and harvesting	15 65	"
Total cost of producing mangolds or turnips	\$53 00	

HOW TO CHARGE THE COST OF THE MANURE.

In regard to the only debateable part of this statement—the apportionment of the manures used—I go upon the plan adopted by Dr. Laws, of England, who has been experimenting in this respect for the last forty years, and there is no doubt that in adopting his data, we have something very reliable. I now, therefore, proceed to give you something to be credited to this \$53.

Credit $\frac{1}{3}$ of unexhausted farm-yard manure	\$15 60	
" $\frac{2}{3}$ of special manure	6 90	
	—\$22 50	
" allowance for extra cultivation of roots, in view of future crops	2 50	
" half expense of distributing	2 00	
Total	\$27 50	
To be deducted from	53 00	
Leaving as the actual cost of an acre of mangolds or turnips	\$25 50	
The value of an average crop of mangolds or turnips, 670 bushels, at 9 cents, is	60 30	
Profit per acre	\$34 80	

VALUE OF THE TURNIP TOPS.

If I were to credit the crop with what is left of the tops of turnips, which are said to be equal to what is taken off the soil in the bulbs, the result would show a greater profit still, although I will not go that length.

COST OF GRAIN CROPS.

The cost of producing the various grains per acre is as follows:—

WHEAT.

Fall ploughing, gang-ploughing, harrowing, seed and seedling, rolling, harvesting, threshing, and preparing for market	\$8 35
Debit value of manures, half of residue	12 50
Total cost	\$20 85

[Professor Brown.]

Value of average crop of 35 bushels of wheat, at \$1.15.....	\$40 25
Value of 1½ tons straw at \$5	7 0
	<hr/> 47 75
Wheat, profit per acre.....	\$26 90
OATS.	
Work as above for wheat.....	\$8 35
One-third proportion of manure residue.....	8 33
	<hr/> \$16 68
Total cost.....	
Value of average crop of 41 bushels, at 40 cents.....	\$16 40
Value of 2 tons straw, at \$6.....	12 00
	<hr/> 28 40
Oats, profit per acre.....	\$11 72
BARLEY.	
Work as above for wheat or oats.....	\$8 35
One-fourth proportion of manure residue	6 25
	<hr/> \$14 60
Total cost.....	
Value of average crop of 32 bushels, at 65 cents.....	\$20 80
Value of one ton of straw.....	3 50
	<hr/> 24 30
Barley, profit per acre.....	\$9 70
HAY.	
Mowing, making, and hauling	\$1 50
One-fourth proportion of manure residue	6 50
	<hr/> \$8 00
Total cost	
Value of 1½ tons of hay, at \$10	\$18 00
	<hr/> \$10 00
Hay, profit per acre	
PEAS.	
Sod-ploughing, seed and sowing, and harvesting	\$5 25
Unexhausted manure.....	3 00
	<hr/> \$8 25
Total cost	
Value of 30 bushels of peas at 60 cents	\$18 00
Value of 1½ tons of pea straw, at \$5	7 50
	<hr/> 25 50
Peas, profit per acre.....	\$17 25
CARROTS.	
Cost of cultivation, as for mangolds and turnips.....	\$48 86
“ harvesting	8 00
	<hr/> \$56 86
Total cost	
Credit unexhausted manures	25 00
	<hr/> \$31 86
Actual cost	
Value of average crop of 540 bushels, at 15 cents.....	81 00
	<hr/> \$49 14
Carrots, profit per acre.....	

[Professor Brown.]

POTATOES

Cost of cultivation as in other root crops	\$48 86
Cost of harvesting	5 50
Total cost	\$54 36
Credit unexhausted manures.....	25 00
Actual cost	\$29 36
Value of average crop of 165 bushels, at 35 cents.....	57 75
Potatoes, profit per acre ..	\$28 39

CALCULATIONS AS TO MANGOLDS AND TURNIPS.

In the case of growing mangolds and turnips, fully one half the cost of establishing them lies in the value of the manure, and one-seventh of the whole cost consists in harvesting. The total value of the crop is equal, almost exactly, to the gross cost of production when exhausted manures are not credited, and when these are credited the actual cost is reduced one-half, so that we have a net profit nearly equal to this *bona fide* cost. The facts are the same for potatoes, but there is a very high figure in favour of carrots.

THE GRAIN CROPS.

With grain proper we have:—

	First Cost	Gross cost.	Value of Produce.	Profit—with first cost.	Profit—with gross cost.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Wheat.....	8 35	20 85	47 75	39 40	26 90
Oats.....	8 35	16 68	28 40	20 05	11 72
Barley.....	8 35	14 60	24 30	15 95	9 70
Average.....	8 35	17 38	33 48	25 13	16 11

So that were we not to charge the succeeding crops after roots with part of the value of the manures, the profits would be nearly double in the case of wheat, oats, and barley—from \$16.11 to \$25.13. But I prefer to discuss the subject from the whole course of a rotation, and the mean of the results of each class of crop, and not from a particular crop.

ACTUAL PROFITS.

From the abstract it appears that the actual profits from one acre over several years, by ten kinds of crops (including mangolds and spring wheat), is \$23.50, and it costs \$19.72 to produce this crop. What, then, is the application of this supposed profit of \$23.50 per acre?

DISTRIBUTION OF THE PROFIT.

In the first place, it is the natural outcome of the sum of \$75 originally invested in land, implements, and horses, and subsequently of the use of labour, implements, manure, seed, and skill. We have already debited all these, with the exception of skill, so that all we have to do is to distribute this profit of \$23.50.

[Professor Brown.]

CHARGES OF INTEREST ON CAPITAL.

When the regular accountant begins by debiting interest on original investment, and follows with the various charges we have already handled, I am unable to see why it should form an actual item in such a form, because the total results, whether of profit or loss, is just the interest, or no interest, upon the original investment, and in our case of producing crops, may not be all the profit or loss in the management of a farm, as the producer, being also the owner and feeder of the live-stock thereof, has to run another line of chances when transferring these crops to the various animals, whether for labour, milk, beef, mutton, wool, pork, or household maintenance; he does not pay rent or interest on capital, and thus altogether the farmer is now in possession of crops, valuing in the market an average of \$20.38 per acre, with which to make further investment.

PRESERVATION OF FARM-YARD MANURE.

With reference to the question of manures, and first with reference to the preservation of farm-yard manure, we should perhaps go further back and inquire as to the best mode of making it through the animal system. The best way to preserve it is a matter of difference of opinion. My experience goes to show that a very important item in its management is covering so as to prevent the rain from washing it. Our practice is, simply to put it out in a heap, mixing the horse manure with the cattle manure.

USE OF GYPSUM ON FARM MANURE.

In order to save it from too rapid decay, we always have made a point of scattering a quantity of gypsum over the heap. There is nothing so good as to send a pail of gypsum around twice a week. This retards too rapid fermentation, and of course adds very much to the manurial value of the heap.

PREVENTING TOO RAPID FERMENTATION.

I need not say anything as to the importance of preserving the liquid manure—of course that adds very much to the value of the heap. One of the best ways to prevent too rapid fermentation of the manure is to let the cattle run over to compress it and prevent too much air from penetrating it.

ROTTED MANURE—BRAN.

I always use farm-yard manure in a rotted state. If we believe what the chemist tells us, there is no question but that there is a very large value in bran as a food for the production of manure. There is no better way of putting the idea than by saying that the best food makes the best manure.

SPECIAL FERTILIZERS—LIME.

With regard to the use of special fertilizers, lime is generally best on mucky soils with grain crops, at the rate of 6,000 lbs. per acre.

MINERAL PHOSPHATES.

Mineral phosphates are best on old loamy lands for root crops at the rate of 200 or 300 lbs. per acre.

SALT.

Salt is best on what are called vegetable soils, both with grain and roots, at the rate of 300 or 400 lbs. per acre.

[*Professor Brown.*]

GYPSUM.

Gypsum is most valuable for grasses, on all kinds of soils, at the rate of about 250 lbs. per acre.

BONE DUST—FINER THE BETTER.

Bone dust is valuable for roots at the rate of from 200 to 300 lbs. per acre. The value of bone dust depends very much upon the way in which it has been manufactured—the finer the better, if you want immediate effects.

THE USE OF FERTILIZERS.

I am of opinion that these special fertilizers are only required in two cases—first, where the land has been exhausted to a large extent, and where there is a desire to increase its fertility more rapidly than could be done with the use of barn-yard manure; and second, where the land may be very good, but has become what is called lazy, and requires some stimulant to assist its vegetation.

BARN-YARD MANURE THE STAPLE.

Outside of these two cases, I am of opinion that the farmer, by paying proper attention to the making of his barn-yard manure, to the feeding of his cattle, and to the management of the manure heap, will have absolutely no need of using special manures. I substantially agree, however, with the evidence previously given in favour of these fertilizers—as to the effects of salt in strengthening the straw, and gypsum in promoting the early growth of turnips.

DRAINAGE—ITS BENEFICIAL EFFECTS.

I suppose it is unnecessary that I should say much about the advantages of drainage. The proper drainage of land cannot produce drought; it has the very opposite effect. Well drained land holds moisture longer than any other land, only it holds it evenly. Upon the model farm we have had many practical proofs of the value of drainage. I can now point to fields there from which the removal of what is called superfluous water has produced wonderful results. Drainage allows of the free access of air into the soil, and renders available material which would otherwise have been useless.

DRAINAGE ALONE NOT SUFFICIENT.

But drainage cannot stand alone. Many people have the idea that when they have drained their land there is nothing more to be done. If drainage is not followed up with improved methods of farming it is comparatively useless. When land is properly drained, we can get upon it earlier in the spring, and this is a saving of time, labour, and seed. much of the seed sown in the spring is destroyed by various causes, and more is destroyed by water, and this destruction is avoided by proper drainage. It further assists us in pulverizing and cleaning our soils, as well as quicken the action of manures.

A FALLACY.

Some people imagine that lime will improve wet lands. There is no greater fallacy. You may as well throw water upon wet land as lime.

FURTHER GOOD RESULTS OF DRAINAGE.

Drainage therefore hastens the harvest. It also increases the nutritive value of wheat and other grains. Another valuable effect of it is the removal of the causes of

[*Professor Brown.*]

diseases among certain animals. It improves the general health of the district, renders the water purer for animals, and altogether effects improvements which cannot be over-estimated.

COST OF TILE DRAINING.

With regard to the cost of draining land, I have a statement giving the cost PER ROD of sixteen and a half feet. It is as follows :—

	Cutting.	Laying Tiles.	Filling Drain.	Cost of Tiles.	Total Cost.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Four feet drain, with four inch tiles,	0 35	0 5	0 5	0 32	0 77
Three feet drain, with three inch tiles,	0 25	0 5	0 4	0 24	0 58
Four feet drain, with six inch tiles,	0 35	0 5	0 5	0 80	1 25

FINANCIAL RESULTS OF DRAINAGE.

With regard to the increased value and productiveness of land by underdrainage, I may say (1) wet land, such as swamps, is of no agricultural value; (2) half wet land, such as meadows, is worth fifty cents per acre in rent; (3) partially wet land, all over, is worth \$1.50 per acre; (4) land wet in spots, to the extent of one-tenth of its area, is worth \$2.50 per acre; (5) drained land, or naturally dry land is worth \$3.50 per acre. Land wet all over will cost \$30 an acre to complete, in new townships, therefore, doubling the cost of land, and in old ones half the cost. Drainage repays itself in four years, if followed up by good farming.

CATTLE AND BEEF—MILK.

In speaking of cattle, I presume I should consider the two products, beef and milk. I have had considerable experience of the different breeds of cattle, both in the old country and in this, and I will endeavour in a few words to give you my opinion of each of the principal breeds.

THE DURHAM OR SHORTHORN.

Beginning with the famous Durham or Shorthorns, I would say that either for beef or for milk, I do not think there is anything that can equal them. I say this advisedly, after many trials of the different breeds. They may not do so well as some other breeds on poor pasture, but for improving other breeds, and for early maturity and weight in itself, I do not think there is anything in the hands of man at the present time to excel the Shorthorn.

THE HEREFORD—ITS MERITS.

When we speak of the Hereford, we speak of something that does not on the average equal the Shorthorn in weight or in early maturity, but we do speak of something that will endure hardships better, and thrive better on poor pasture. The Hereford is very considerably ahead of the Shorthorn in regard to its value for grazing purposes. We may say, therefore, that the Shorthorn is a better stall feeder than the Hereford, and that the Hereford is a much better grazer than the Shorthorn.

THE POLLED ANGUS, OR ABERDEEN POLLED.

There is another beefer—and when speaking of beefers, I think we can only speak of three breeds which are of any consequence—Shorthorns, Herefords and what are called Aberdeen Polled.

[*Professor Brown.*]

WHERE IT IS AND IS NOT EQUAL TO THE DURHAM.

I am very well acquainted with the Aberdeen Polled, and it is well known that for early maturing it is equal to the Shorthorn, though not, so far as our experience goes, equal to it in improving other breeds or in attaining a greater weight in a certain time. At the present time we may call them our second best beefing breed.

TUBERCULOSIS.

I am sorry to say that I have had considerable experience with tuberculosis, or animal consumption among cattle in Canada, but I do not find that the Shorthorn is any more liable to it than other breeds. We have had cases of it among all breeds except the Hereford. With the exception of this disease, which has attacked our cattle considerably, we are remarkably free from cattle diseases in this country.

CATTLE FOR MILKING—THE CANADIAN COW.

With regard to cattle for milking purposes, looking to the experience I have had during the last ten years, I would say that if I were to select an animal for its milking properties alone, I would have no hesitation in making choice among the better animals of what are called Canadian cows, as against any Ayrshire or Jersey I have ever seen, for our province.

A SHORTHORN GRADE FOR COMBINED PURPOSES.

But, if I were looking for another line of profit along with milking properties, I would have no hesitation whatever in choosing a Shorthorn grade.

WHAT THE CANADIAN COW IS.

It is very difficult indeed to say positively what the Canadian cow is. I presume it is something that is not native, but has been brought to this country from the United States, probably fifty or sixty years ago and later, and has become mixed with Shorthorn blood, and then wandering in the bush, they largely lost their beef properties, but still retained their milking properties, which are not so much impaired by in-breeding. So that I do not know what to call the Canadian cow exactly, though I fancy it is one-fifth or one-sixth Shorthorn, with a spark of Devon and Ayrshire here and there.

THE AYRSHIRE FIRST AS TO QUANTITY.

When I speak of the native cows' milking properties, I do not refer to quantity alone, but also to quality. There is no doubt that the Ayrshire is first with regard to quantity, although she will not endure the same pasture as the Canadian cow; but looking at all sides of the question, I am convinced from my own experience that a proper choice of the Canadian cow is ahead of the Ayrshire for our Province.

THE DEVONS—RICH MILK BUT SMALL QUANTITY.

The Devon cattle I cannot recommend as equal to the other beefers named unless it be for rich milk in moderate quantities.

A SLOW BEEFER—GOOD FOR DRAUGHT PURPOSES.

The Devon is slower for our purpose of raising beef rapidly for the British market. As workers, with strength and endurance, the Devons are first-class animals and they are found of large value in clearing our back townships.

The Commission then adjourned.

[*Professor Brown.*]

Toronto, October 27th.

The Commission resumed at nine o'clock A.M., when Mr. BROWN continued his statement as follows :—

COMPARATIVE EXPERIMENTS IN MILK PRODUCTION.

I desire to lay before the Commission some facts with reference to the value of milk from different breeds of cattle, and I wish to speak specially of the pure-bred Ayrshire, the pure-bred Shorthorn, the pure-bred Hereford, the pure-bred Aberdeen Polled, the Shorthorn grade and the Hereford grade.

FOUR THOUSAND ONE HUNDRED OBSERVATIONS.

I may state that the examination of this question extended over eighty days during last winter, and was checked by about 4,100 observations, so that I have no doubt of its thoroughness. Notes were taken of the temperature of the stables, the quantity of milk by weight and by measure, the specific gravity of the milk previous to settling, the temperature of the dairy, the duration of the setting, the manner of setting, whether shallow or deep, the time given for the cream to rise, the weight of cream removed, the temperature of the milk before setting, the quantity of cream tested by tubes, and any difference in the condition of the cows during the experiment. I submit a series of illustrations, which show more plainly than I can, the results of the experiment. (*See diagram, inserted as a fly-sheet.*)

SPECIFIC GRAVITY OF THE MILKS.

In analyzing this table it is interesting first to notice the difference in what is called the specific gravity of the milk from animals of different breeds, as well as from different animals of the same breed. If the lactometer is a true indicator of the weight of milk relatively to distilled water, and if weight indicates thickness or creaminess, then the higher the figures in the first column the richer should be the milk. In this example we have

The Aberdeen Polls first at.....	111.0
The Hereford Grade second at.....	106.0
The Shorthorn Grade and the Ayrshire Grade equal at.....	103.0
The Hereford fifth at.....	91.0
And the Shorthorn last at.....	86.0

(*See Fig. 1.*)

THE TEST NOT ALWAYS RELIABLE.

But the graduated piece of glass would register the same and higher figures, were certain foreign matters introduced into the milk, or were the milk adulterated with water, so that no reliance can be placed upon such a form of ascertaining either the purity or the richness of milk.

THE GRADATIONS DISCUSSED AND CONSIDERED.

Of course, with us all the milk was pure, and consequently it may be assumed that the instrument did indicate some sort of relative properties in the milk as compared with pure water. Are we to conclude that the famous beefing Shorthorn used a much larger proportion of the fatty and solid matters of food in maintaining her constitution, by as much as 25 out of 111? And in these respects is there no difference between the milking Ayrshire and the beefing Shorthorn grades? The Hereford also ranges low in this indication, but its cross with the grade rises to the second place among the six. Another point of much value, especially to those who now send cream in place of sweet milk to the creameries, is what is shown in the second column of the table.

[*Professor Brown.*]

*SPECIFIC GRAVITY of Milk
from different breeds of Cows*

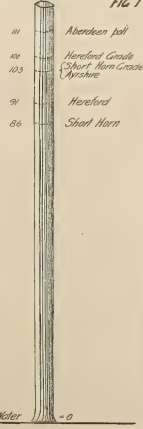


FIG 2.

CREAM BY VOLUME — from different breeds of Cows



CREAM BY WEIGHT — from different breeds of Cows

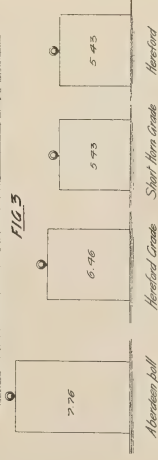
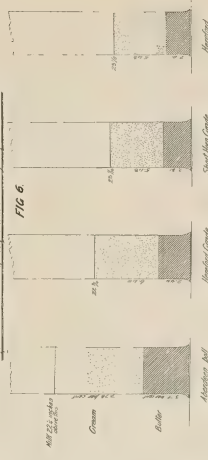


FIG 4

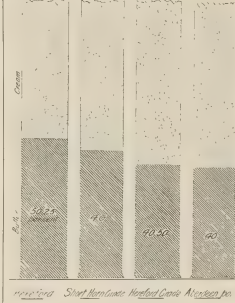
BUTTER-farm Milk by Weight



Agreement of Cream by Weight with Butter by Weight from Milk



Butter from Cream



USE OF THE CREAMOMETER.

In our plan of work, creamometers were used to test the percentage of cream that would rise in twenty-four hours. The tubes were filled every day for a period of three months, and all conditions, such as temperature, were properly attended to. As regards a certain column or body of cream rising in a given time, I have no doubt of the accuracy of this test of the different breeds, and to illustrate this I show on the diagram the amount of cream by volume from a given quantity of milk from the different breeds of cows. (*See Fig. 2.*)

CREAM IN RELATION TO BUTTER.

A large volume of cream does not necessarily imply a corresponding quantity of butter any more than high specific gravity denotes quantity of cream; but when cream is sold by bulk, as is now the increasing practise in the management of creameries, it is evident that some regard should be paid to the kind of animal giving the milk, and the time given the cream to get to the surface. The creamery will not object to the farmer allowing his milk to stand for twenty-four hours, so long as its sweetness is not destroyed, because the last cream is always the heaviest and best for the butter maker.

A POINT TO BE CONSIDERED.

But, if there is no corresponding thickness of buttery materials—in the Shorthorn for example, as compared with the Hereford—then he will soon find that in paying as much for the one as for the other, all the while that the Shorthorn may be, as we shall see, forty per cent. less in the property of giving butter from cream than the Hereford, he is paying sixty-six per cent. more for the Shorthorn milk than for the Hereford milk.

APPARENT POORNESS OF AYRSHIRE MILK.

The milk of the pure-bred Ayrshire is apparently not half so rich as either that from the Shorthorn grade, Shorthorn, or Hereford grade, and is twenty-five per cent. less than the Hereford and Aberdeen Poll, and forty per cent. less than the mean of all. The Ayrshire, then, may not be the best breed for the creamery, and certainly, if there is only an approximation to the truth in this matter of cream volume in the different breeds of cattle, the immense difference of 124 per cent. that the Hereford grade shows over the Ayrshire is enough to give rise to serious thought on the part of both the farmer and the creamery man.

ANOTHER VIEW OF THE SUBJECT.

Meantime, let us pass to another view of the subject. The difference in weight in equal bulk of the same material is evidence of the presence of different proportions of the same constituents, and in our case, of milk from various breeds of cattle, should guide us in arriving at cream volume or value. I am sorry to be unable to submit the Shorthorn and the Ayrshire in this respect, because of some irregular conditions at churning time. (*See Fig. 3.*)

RICHNESS OF THE ABERDEEN POLL'S MILK.

In the case of the four others, we have the Aberdeen Poll in advance with 43 per cent. over the Hereford and the Shorthorn grade, which are equal with 24 per cent. over the mean of all. In Wallace's Monthly, volume 4, page 832, is the following reference to the richness of the milk of the Aberdeen Polled; "the Scotch Polled cattle are superior for beef, but only moderate for the dairy. Their milk, however, is generally rich, and, some contend, is nearly equal in this respect to that of the Jersey or Guernsey." All our experiments go to corroborate that view.

[*Professor Brown.*]

YIELD OF BUTTER.

In this illustration you will observe the exact agreement between the weight of cream and the specific gravity of the milk of all the cows. If, then, the weight of cream agrees with the produce of butter in each case, we may be led to place some reliance on specific gravity after all—that is to say, when the milk is pure. The following illustration will show the quantity of butter received from the several creams, and what has been its proportion to the original milk. (*See Fig. 4.*)

MILK—CREAM—BUTTER.

There is no agreement, or rather there is a diverse agreement, between the proportion of butter from a given quantity of milk to that of butter from a given quantity of cream. The Polled cow with its three and three-quarter pounds, nearly, of butter from 100 pounds of milk, gives the lowest, or 40 per cent. of butter from 100 pounds of cream, while the Hereford with only two pounds of butter from 100 pounds of milk, gives as much as $50\frac{1}{4}$ pounds of butter from a like quantity of cream. It appears therefore, that in every case where the weight of butter is low, relatively to the quantity of milk, the weight of butter from the cream of that milk is correspondingly high. (*See Fig. 5.*)

AN IMPORTANT MATTER.

Here, then, is valuable guidance for farmers, dairymen, and creamery men. For example, in sending milk to the creamery, the farmer is credited with the average proportion of cream that rises from all the milk, so that, if the average be $2\frac{2}{3}$ pounds of butter from every 100 pounds of milk, while the creamery men obtain $41\frac{1}{3}$ pounds of butter from every 100 pounds of cream, there is something in getting milk from different breeds of cattle.

AVERAGES OF CREAM AND BUTTER FROM MILK.

On an average of breeds, we find that every 100 pounds of milk give $6\frac{1}{4}$ pounds of cream, every 100 pounds of cream gives $41\frac{1}{3}$ pounds of butter, and every 100 pounds of milk gives $2\frac{2}{3}$ pounds of butter. (*See Figs. 6 and 7.*)

EXPERIMENTS ELSEWHERE.

In comparing these results with those of experiments made in other parts of the world, I noticed considerable difference, our averages being in some cases higher, and in some cases lower. In making our experiments we had two animals of each breed, and in one case three. They are just the beginning of an inquiry that may last for several years, as the experiments must be repeated again and again before we can say that our results are worthy of implicit reliance.

THOROUGHbred OVER COMMON STOCK—A COMPARISON.

As to the advantages of a thoroughbred over a common animal, I will give you the result of carefully conducted experiments on this subject, which were so regulated as to show the increased weight per head per day. A thoroughbred will add to its weight at the rate of 1.72 pounds per day, reaching the weight of 1,892 pounds in three years, and a value of \$114. A high grade will gain 1.74 pounds per day, reaching a gross weight at the end of three years of 1,914 pounds, and being valued at \$115. A common feeding steer under the same management as the others will gain 1.30 pounds per day, or equal to 1,430 pounds in three years, and a value of \$79. Practically there is no difference between the thoroughbred and the high grade with respect to weight and value, but there is a difference of \$35 against the common animal. This is the result of a very large number of experiments, not only in Ontario, but elsewhere.

[*Professor Brown.*]

AVERAGE WEIGHT OF STEERS—COST OF FEEDING.

The average weight of the steers we have been accustomed to handle is 1,745 pounds, and I can give you accurately the cost of bringing that animal to that condition at three years old. The milk necessary to maintain that steer while a calf will cost \$23; it will eat \$60 worth of roots, \$44 worth of grain, \$21 worth of fodder of different kinds, and \$15 worth of pasture, and its attendance, taken in connection with the attendance of a large number of other animals, will cost \$12, making a total of \$175 against the steer. The largest sum which can possibly be received at present for that animal is \$105. There is, therefore, an apparent loss of \$70. You are aware that no animal will pay directly for the food it receives.

FERTILITY OF THE SOIL TO BE CALCULATED.

I think that no farmer should count the cost of raising cattle, except in connection with the effect which the fattening of the animal has in maintaining the fertility of the soil.

VALUE OF MANURE.

This brings us to the question as to the value of manure, as against this apparent loss of \$70. What I have to say on that subject I will make very short by remarking that the value of the manure produced by an animal, from its birth to the age of three years, is, at the least, four cents per pound for every pound the animal then weighs, and in saying that, I am giving the experience not only of Ontario, but the experience of Europe for the last fifty years. That comes to \$69.80. Then there is the advantage of obtaining that manure as a certainty, which could not be depended upon unless from such a source.

BEEFING—RATE OF INCREASE.

With reference to the beefing of animals, it is to be noted that, the older an animal becomes, the less percentage of increase it shows to its original weight and the amount of food it consumes, so that I hold that it does not pay to keep animals of this kind longer than three years, if they have been well done for all along.

CATTLE AT TWENTY-TWO MONTHS.

As an example of this, I may state that five cattle when twenty-two months old weighed 1,102 pounds each, and the most that can be obtained from them at that age is four cents a pound, or \$44. At twenty-nine months old they averaged 1,477, and they will bring at that age 6 cents a pound, or \$88. If these cattle had been kept for seven months longer they would have increased to 1,717 pounds, and yet we would get no more money for them, unless they were extraordinary beasts, or fatted up for exhibition.

MARKETABLE ANIMALS.

But we are speaking now of marketable animals, and such an animal would bring an average of only \$103, or 16 per cent. of increase, as against 31 and two-fifths per cent. in the first case. The question here is, did it pay to sell at 29 months or at 36 months? The animal at 29 months fetched \$88, and cost \$147, leaving an apparent loss of \$59, while the animal at 36 months fetched \$103, and cost \$184, leaving an apparent loss of \$81, showing a difference of something of over four per cent. in favour of the younger animal. I feel quite certain that the sooner we can get rid of our beefing animals the better.

[*Professor Brown.*]

THE SOILING SYSTEM.

On the soiling system in connection with cattle feeding, I lay on the table a paper which I read on this subject before the Dairymen's Association last season, and to which I have nothing further to add now.*

GREEN FODDERS.

I wish to say a few words regarding the value of certain green fodders.

LUCERNE.

Taking lucerne first, I can report that it has done well on the hill at Guelph, and the fact of its having done well there is sufficient evidence that it will do well in this country generally. There is no difficulty in growing it; it should be sown in the spring broadcast, or in a drill if your land is dirty. If sown broadcast, it should be used to the extent of from fifteen to twenty pounds per acre, and if not sown too deep it will yield one if not two crops in the first year. This plant is a native of California, and can be relied on with the same plants for seven or eight years in succession, sometimes growing so abundantly that it can be cut four or five times in the season. I would recommend, however, that it should be pretty liberally dealt with, getting at least one coating of farm-yard manure, well rotted, every second year, and with four or five cuts per annum, you can always be sure that it will yield twenty tons of fodder per acre. This year, during the drought, we had to resort to feeding our cattle, and even our sheep sometimes, with green fodder.

SANFOIN.

The sainfoin is another form of clover which has done pretty well, but it does not last so long as the lucerne. It runs out every three years. It gives a strong crop of straw, however, and comes early, and is a good thing to vary along with other clover and grasses.

PRICKLEY COMFREY.

There is no difficulty in growing the new plant called prickley comfrey—it will thrive on a turn-pike road. What its value is for feeding purposes I cannot say from experience, but I can testify to its extraordinary vitality under poor conditions. You can cut it three or four times a season. Our cattle have not taken very favourably to it, very probably because they have been getting so many other good things, but the sheep like it very well. I do not see why it should not become a valuable addition to our green fodders, as it requires so little cultivation. It has been our custom to cut this fodder every month, or to give it four or five cuttings every season. The land requires to be pretty clean. If it is dirty, it is better to drill and cultivate it; but if clean, a broadcast sowing will produce a more regular crop. In using for green fodder it is best to cut early.

GROWTH OF SORGHUM.

There seems to be no difficulty either in growing what is called the sugar cane or sorghum. If it will mature its seed and stalk, as it does, on the top of our high hill at Guelph, it ought to do so in almost any other part of the Province, so that any one who chooses to experiment with it need have no fear of being unsuccessful.

EGYPTIAN CORN—SUGAR BEETS.

What is called the Egyptian corn, which has only been introduced during the present

* The paper referred to is given at page 183.

or the previous year into the Province, has not matured with us. The sugar beet, as we know, can be cultivated to a very large extent in the Province. There is no difficulty in growing it as successfully as any other roots.

MIXED GRASSES—A RECIPE.

I wish to place upon record here a mixture of grasses and clovers for permanent pastures, which I have found to be most successful. The mixture should be sown to the extent of 26 pounds to the acre, and this quantity is made up as follows:—

Timothy	6 pounds.
Orchard Grass ..	3 “
Red Top	1 “
Meadow Fescue	1 “
Kentucky Blue	1 “
Yellow Oat	1 “
Fan Oat	1 “
Bent Grass	1 “

Making 15 pounds of grasses proper along with the following clovers:—

Lucerne	5 pounds.
White or Dutch Clover	3 “
Alsike	1 “
Red	1 “
Trefoil	1 “

Making 11 pounds of clover, which, with the 15 pounds of grasses, make 26 pounds of seed altogether.

MANAGEMENT OF PERMANENT PASTURES.

The proper management of permanent pasture involves a rich surface, spring seedling, easy first year grazing, and top dressing every third year, either with compost, bones, or farm-yard manure. Nobody can expect to keep up permanent pasture unless he provides it with some nourishment.

ADVERTISED CATTLE FODDERS.

I have tried most of the advertised cattle fodders, and I believe in some of them, as for instance, Thorley's Cattle Food as a stomachic. I always use it when the animals are sickly, and I find it good for both cattle and horses in every case. But it is too expensive to be used as a feeding material, and I do not know that it is so good for that purpose as others. I approve of its use as a medicine only. I think the food manufactured at Hamilton, under the name of Thorley, is very good; I think it is genuine Thorley.

FORESTRY—COST OF PLANTING.

Upon the subject of forestry, I will show you what it costs per acre to put down young trees taken from your own or a neighbour's bush, a method of replanting which can be adopted at the least possible expense, and I think with the greatest possible success.

WHAT TREES TO SELECT.

In selecting trees for replanting, it is best to keep on the small side. It is a great mistake to go into six or eight feet trees if you want rapid success. Two or three-foot trees will ultimately do much better. I think it is an important point gained if we can show the Canadian farmer how he can be his own nurseryman and do his own replanting.

[*Professor Brown.*]

PLENTY OF YOUNG TREES.

There are thousands of young trees in every farmers' neighbourhood which need cost him nothing but the expense of collecting them. If he has to pay ten cents to a nurseryman for every tree he plants, he will do very little in that way.

EXTENSIVE PLANTING OPERATIONS.

I have been in the habit of planting one and a half million of trees a year, and they did not cost more than ten shillings and sixpence a thousand, and if our Government or private parties took the nursery management of such trees, I think they could be produced in Ontario at less than eight dollars a thousand.

COST AS TESTED BY EXPERIMENT.

I have started an experiment upon this subject upon the Model Farm at Guelph, and I have found the cost to be as follows—per acre :—

Clearing and preparing the ground	\$9 44
Digging pits	8 88
Fencing	4 75
Planting	11 50
Pruning	0 75
Mulching	2 25
Taking trees from the forest	18 50
Heeling	0 50

Total cost \$56 57

If the farmer does not estimate the value of his own labour, and of the labour of his horses, you may reduce that about one-half.

NO MANURE TO FOREST TREES.

I do not believe in manuring forest trees—I have never seen any good effect from it, and I am expressing not only my own experience, but the experience of others dating fifty years back.

TREES SIX OR EIGHT FEET APART.

We have had evidence of great weight that trees should not be planted less than six or eight feet apart, and that gives about 900 trees to the acre. We planted that number this season, and there are now 715 alive and doing well, showing an actual death-rate of one-fifth. The deaths, however, occurred principally among the pine and the spruce; apart from these, the deaths were comparatively few.

STANDARD TREES.

In planting strips of wood for the protection of crops, I cannot recommend anything but standard trees.

GOVERNMENT TO ACT IN THE MATTER.

I am of opinion that the Government should take in hand this matter, and show our farmers how to raise trees and nurse them, to experiment where required, to offer trees to farmers at cost price, to distribute instruction by means of a special text-book, and to appoint an inspector or conservator of forests, whose duty it would be to examine and report annually, and to pay a premium per acre for all trees planted. I am not advising that the Government should assume the business of a nurseryman, but somebody must begin this matter, and unless the Government show how it can be done, the progress will probably be slow.

WILLIAM BROWN.

[*Professor Brown.*]

THE SOILING SYSTEM.

AN ADDRESS DELIVERED BY PROFESSOR BROWN, FEB. 20TH, 1880.*

I desire distinctly to confine myself to the produce of certain crops used for "*Soiling*" as against the prevailing summer management of cattle we call "*Grazing*." It would be easy to bring in the important story of the use of auxiliaries in both cases, but to do so would complicate and take from the value of the comparison. Soiling, then, is the housing of cattle at all seasons, and distinctively, in our circumstances, from the middle of April to the middle of October, when all their food is taken to them from the fields in place of their being allowed to search for themselves.

GRAZING.

First, what is our position in Ontario as cattle graziers? We cannot secure the rich old pastures of England, such as our soils are, because we cannot secure variety enough of grasses (which means fifteen to twenty kinds) to give a close bottom, and offer that *succession of herbage* best for the health and growth of animal life. Our droughts, and especially our winters, are against this; we have rain enough per annum, but it is not distributed sufficiently to give the regular top-dressing so essential to continuous greenness. Here permit the remark that as we have ourselves been the cause of this irregularity of rainfall, and temperature to a certain extent, so it is left to us to make good the balancing of the things in nature that have been displaced—how and where the meteorologist and horticulturist will explain by-and-by, for as sure as we are opening ourselves to the world's public markets so sure are we bound to leave no stone unturned in view of national eminence among them.

SLOW PROGRESS.

On an average of seasons, on putting a cattle beast to the field, without any grain or cut fodder helps, there is no going back, neither is there much progress in flesh making, there is growth of bone and muscle, but comparatively little finishing on the outside or inside. So then we can make the frame in the field, but not complete it for the home or foreign market. In this respect, therefore, we cannot possibly compete at present with some parts of the world. What applies to beef making applies to the making of milk.

With unreliable pastures for *continuous progress* in beef or milk production, the question before us is, How can we better ourselves? We have the soil, or soils, we have the indispensable sunshine, as also the irregular showers, and all the essentials towards the upkeep of fertility. Have we the enterprise, or shall I call it the necessary common sense? Indeed history, past and present, shows that with such a sunshine as ours, some nations would be in possession of an enormous agricultural wealth, by the simple economy of that sunshine in the production of repeated crops of fodder plants in one season, even from a bed of sand.

ESSENTIALS IN GREEN FODDERS.

We want then to secure such a succession, or association, of green fodders during six months of the year as shall secure the following objects:

1. An early cut.
2. Repeated cuttings of the same plant.
3. A sufficient number to offer an unbroken supply of succulent herbage.
4. Kinds to differ considerably in their constituent elements.
5. The largest possible produce per acre consistent with good husbandry, (and this implies much.)
6. High fattening and milking properties.

[Professor Brown.]

* Referred to in Professor Brown's evidence at page 180.

I have no desire to lengthen introductory remarks, and shall now submit for your consideration, first, a diagram, showing what crops, in our present knowledge of things, can be cultivated in view of these objects. In this we have the experience of different parts of Canada, and particularly that of the Ontario Experimental Farm

GREEN FODDER FOR SOILING IN CANADA.

KIND.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Number of Cuttings.	Tons per Acre per annum.	Hay, Weight per Acre, in tons.	Value, per Acre. Hay \$10.
Lucerne.....	38	x 38	38	38	38	38	38	4	16	4	\$38
Sainfoin.....	28	x 28	28	28	28	.....	.....	2	6	2½	17
Red Clover...	31	x 31	31	31	31	.....	.....	2	7	1½	12
Rye.....		31	31	.....	.....	x	.....	2	6	3	23
Tares and Oats.....	x ¹	x ²	20	20	.....	.....	.....	1	6½	4	20
Prickly Comfrey.....	.....	.....	27	27	27	27	.....	3	10	2	14
Millet.....	.....	x ¹	x ²	36	36	36	.....	1	3	3	13
Rape.....	.....	x ⁴	.....	25x ²	25	25	25	1	15	6	37
Corn.....	.....	x	.....	20	20	20	20	1	20½	10	50
Cabbage and Kale.....	.....	.....	x	.....	21	21	21	1	12	6	31
Tonnage per month.....	3	10	13	22	22	18	13	18	2½	4	25½

Mean value of green fod- der per month. Rich pastures equal to .40.	{	.32	.32	.29	.28	.28	.27	.26	{	Average value dry weight. = \$6.40 per ton. Average value green weight. = \$2.15 per ton.
		x Dates of Sowing.								

In this we have an exhibition of twelve varieties of plants from the middle of April to the end of October, in the order of earliness. Each horizontal bar represents one acre, and the time during which each plant can be cut and used on an average of seasons. The date of sowing is shown by a cross, and the number of times the same plant can be cut in one season is given in the first column after October. Following the latter information is the quantity of green fodder obtained per acre from any of the kinds all over the season, and adjoining, the weight of these in the dry or hay condition. The last column contains the value per acre of each kind, that value being regulated by the following circumstances.

• VALUE OF HAY.

Good hay from rich pasture is valued at an average of \$10 per ton, and the feeding ratio or nourishing properties thereof stands at 40 per cent; taking these as standards—and they are now recognized as such—we would have this calculation, as regards, for example, lucerne:

If hay equals \$10 per ton and a feeding value of .40, what is four tons of lucerne, the feeding value of which is .38½. The answer is \$38 per acre, and thus all over the different kinds we obtain their comparative values—the figures on the horizontal bars being the percentage of nourishing properties in each case.

[Professor Brown.]

The management of each crop and the characteristics of the several plants should form subjects for discussion another year.

SUCCESSIVE CROPS.

To recapitulate, by the points sought for, we have, as regards an *early cut*, lucerne coming about the middle of April, followed by sainfoin a week later, and red clover at the end of that month, thus obtaining three tons per acre from three varieties during a time when moisture is plentiful and the temperature rarely below freezing point, the average being about 50° and the maximum 4°. This is the welcome start of the season, after the five months of dry fodders, roots and grain.

TWENTY-ONE CUTTINGS.

Repeated, or rather continuous, cuttings of the same spot or plants, four from lucerne, twice from sainfoin, twice from red clover, twice from fall rye, and at least thrice from prickly comfrey; two sowings at different dates of tares and oats give other two cuttings; two also by two sowings of rape, two from two sowings of millet, and one each from corn and cabbage, so that in all we have no fewer than 21 cuttings from ten varieties of fodder plants; as many kinds therefore as should offer an unbroken supply of succulent herbage during the whole summer months, for without tenderness, freshness, and regular supply we are not in a position to impress the value of this system upon the average farmer or dairyman.

On examining the diagram, there is no time of the six months during which there are less than three sorts on hand, and in some months as many as eight; and indeed in place of any want, the difficulty during July and August is to keep up with the succession of offerings before they become woody or matured.

MANGOLDS.

It would not be difficult to add a few other fodders of less importance to this list, and especially to note a fact that on well arranged farms, where root cultivation is a prominent feature, *mangolds* are generally in such quantity, and have come through the winter so fresh and good, that they are not finished until *June*—a very valuable help to, it may be, the scant *early green* fodders.

I cannot recommend the practice—a very old one, now less necessary—of thinning and feeding the leaves of turnips and mangolds, during their growth, but the systematic and careful use of both bulb and leaves of those removed to make room for the permanent crop is another thing, and a very important auxiliary to what we are treating upon.

CHANGE OF FOOD.

As is well known, all animal life must have a change of food in order to secure health and the best production of flesh and milk, and so we are called upon to examine the nourishing values of these various plants as got month by month.

OLD PASTURE FOR MILKING.

Rich old pasture, with its many varieties of grasses, is not only one of the most valuable fodders, green or dry, as is well known for milk making, but it also takes a high place as an actual fattener of animals; for these reasons it is used as a standard for, comparing other green fodders with, and accordingly we shall adopt it on this occasion.

If then good pasture, with its 40 per cent. of nourishing properties, is a standard of nature's making as improved by man for all the essentials of animal life, it must be important to see how far our ten kinds of special green fodders come up to this standard from month to month.

[*Professor Brown.*]

FEEDING VALUES.

Lucerne leads with 38 ; millet, second with 36 ; red clover having 31, and sainfoin, fourth, with 28 per cent.

Three of these in April make a large start, therefore, with an average of 32 per cent., and it will be observed that all the early croppers are very much superior in their feeding values to those that come after June—millet excepted. There is then a range of no less than 18—from 20 in the case of corn, up to 38 in that of Lucerne—and the fact of this difference in feeding value implies corresponding differences in the actual elements of the plants, so that we certainly have variety enough. I shall not labour my paper with any detailed chemical analysis, as I trust it is clear that along with the variety of plants, we have also a variety of elements for all healthy and rapid production of flesh and milk—the man of science says so, and practical experience says so. Of course the mean of 29 per cent. over the season is much below the standard of 40, and this again points to the help wanted by some forms of grain; although many good managements consider it really unnecessary to give grain for milk where green fodders are plentiful and various.

IMPORTANT THINGS.

We have now therefore established two important things :

- 1st. That Canada can grow the necessary variety and quantity of green fodders.
- 2nd. That they are well adapted to the sustenance of animal life for the purposes in view.

SOILING ON A 100-ACRE FARM.

The next question is, What is the proper position of "soiling" in association with grain, root and hay cultivation, and what can be done on a farm, say of 100 acres?

There can be no idea of recommending soiling alone as a separate system of farming in this or any other country, the essentials of life cannot be neglected, nor can the average farmer run the risk of reducing his income by placing all his faith in one or two articles of production only.

MIXED CROPPING.

There must be provision for horses in hay and grain ; pasture for sheep and yearling cattle ; and roots, straw and grain for cattle, sheep and pigs in winter ; and grain and potatoes for family use. By grain I mean wheat, oats, barley and peas, and roots include mangolds, turnips and carrots. We have to deal with the following classes of crops in our rotation.

1—Roots.

2—Grain.

3—Hay.

4—Pasture.

5—Green Fodders.

The green fodders are divisible into—

1—Cereals, one-half.

2—Clovers, one-fourth.

3—Foliage proper, one fourth.

[Professor Brown.]

ROTATION AND PROPORTION.

On soil of an average texture, the best rotation in my opinion is:—

- 1—Peas and *grain fodders*.
- 2—Wheat and oats.
- 3—Roots and *foliage fodders*.
- 4—Barley or wheat (seeded) and *clover fodders*.
- 5—Hay.
- 6—Hay.
- 7—Pasture.

The area of each class on 100 acres would be:

1—Peas, 5; grain fodders 9.....	14 acres.
2—Wheat, 5; Qats, 10.....	15 “
3—Mangolds, 3; turnips, 6; carrots, 1; foliage fodders, 5.....	15 “
4—Barley, 5; wheat 3; clover fodder, 6.....	14 “
5—Hay.....	14 “
6—Hay and pasture.....	14 “
7—Pasture.....	14 “
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100 acres.	

Of the various green fodder crops there would be:

Lucerne,.....	3 acres producing yearly	48 tons
Sainfoin,.....	1 “ “ “	6 “
Red Clover,.....	3 “ “ “	21 “
Rye,.....	2 “ “ “	12 “
Tares and oats,.....	2 “ “ “	12 “
Prickly comfrey,.....	1 “ “ “	10 “
Millet,.....	1 “ “ “	3 “
Rape,.....	2 “ “ “	30 “
Corn,.....	4 “ “ “	80 “
Cabbage and kale,.....	1 “ “ “	12 “
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20 acres giving		234 tons per

annum.

The system altogether then is practically one of five divisions, having equal parts of twenty acres under roots, grain, hay, pasture and *green fodders*.

SEVEN YEARS' COURSE.

Taking a clay loam as the average texture of Canadian soils, it is obvious that a rotation of cropping agreeable to all sound theory and practice, and by which no exhaustion could possibly take place even under careless management, would be what is called the seven years' course, as laid down in these notes. By this our green fodders would accompany the first, second and fourth divisions after sod breaking, so as to agree, and not interfere with systematic rotation and management over the whole farm.

WORKING THE ROTATION.

The sod for one or two years' pasture is broken up and cropped with peas and *grain fodders*, these grain fodders being corn, tares and oats, millet and rye; the second year is wheat and oats in proportion of five and ten respectively; the third in roots with *foliage fodders* in the shape of rape, cabbage, and kale and prickly comfrey—all the latter, as with roots proper, admitting of thorough cultivation, manuring and cleaning, upon which

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rests the backbone of this system. During the fourth year grass seeds (of timothy and clover) are laid down with barley or wheat, and part, if deemed necessary, with *red clover* alone as the green fodder section of this division, and of course the fifth and sixth years are hay, with the exception of, say, one-half of the sixth as *pasture*; seventh year, pasture.

In all this there is an *easy and luxuriant* cropping, suitable to the best of mixed farming and according with the "soiling" system under consideration. There is no excess of grain and hay, but thorough cleaning and strengthening of soils by root management, with sufficient rest (so called) by depasturing with sheep and young cattle.

The twenty acres devoted to green fodders, will on an average, give, under the best management, 234 tons per annum.

WHAT CAN BE DONE WITH THIS AMOUNT OF GREEN FODDERS?

Allowing for waste, one cattle beast of average size, age and circumstances as regards fattening, breeding or milking, will consume daily 100 lbs. of these green materials, along with such dry fodders and grain as may be considered desirable—more or less, of course, according to objects. For the six months named this means the maintenance of twenty-six head, or nearly one and one-third animal per acre. Now, it is well known in Canadian experience that it takes fully three acres of ordinary pasture—not poor pasture remember, but well laid down timothy and clover, to keep one of such cattle in a full progressive condition—either laying on fat decently well, or milking well over the average, no stinting or having the animals walking two miles a day over and over a twenty acre field in search of a bellyfull.

DIFFERENCE IN FAVOUR OF SOILING.

We have, then, the striking difference of four to one, meantime, in favour of "*soiling*," or against grazing, without allowing for any other facts, for or against. Were one-tenth of dry fodders—such as hay and straw—added to the green ones, six more animals can be maintained, but our present purpose is to follow the exact value of the soiling crops alone.

It is rare in these times to find more than fifteen head of cattle beasts in all on a hundred acre farm, summer and winter. So supposing that one-half of the soiled animals, in our example case, were for the butcher, and the other half supporters of the dairy, there would be an additional five head of yearlings and five calves, with one bull, and one score of sheep. The sheep and yearlings would be grazed, but the calves and bull housed and receiving part green fodders; these would be equal to four additional average sized cattle, and so reducing the twenty-six to twenty-two head that can be maintained from twenty acres of soiling materials. Still additional to this would be what would, or should, be used for horses and pigs, so that altogether we arrive at the safe standard of twenty cattle, or one to each acre.

GAIN IN FEEDING POWER OF THE FARM.

Soiling in Canada then is as three to one, and by the system which I thus sketched it is plain that by simply setting aside twenty acres from the hundred, so as not to interfere with the reliable and profitable farming called mixed, or alternate, we can fatten, or dairy, twenty cattle, in place of seven, during the six months of spring, summer and autumn.

FINANCIAL RESULTS.

What now is the financial position in the system?

To this, sketch first the general management that would be adopted: Upon a hundred acre farm such as I have introduced, one man with horse and cart can easily undertake

[*Professor Brown.*]

the attendance in every respect of these ten fattening cattle, ten cows, five yearlings, five calves, one bull and twenty sheep. Any of the yearlings intended for breeding would be grazed during their second summer, but those for fattening should be systematically housed—getting one hour's exercise daily; the calves would also be under cover, the sheep on pasture of course. At the most, then, the cattle man would have thirty head to be soiled. After feeding and cleaning up in the morning he has to cut and cart home 2,500 lbs. of green fodder, in two loads, for the evening use, and as all green fodders are better to be slightly "wilted," not heated, ere offered, he would thus have to secure another cut in the evening to be used for next morning meals.

FINANCIAL RESULT OF SIX MONTHS' "SOILING" FROM TWENTY ACRES.

Ten fattening cattle: 108 tons green fodders at \$2.15. (See diagram)	\$232
Proportion of attendance.....	50
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	\$282
Ten milk cows: 86 tons.....	\$184
Proportion of attendance	40
Milking	20
	<hr/>
Total debit	\$526
Increase on ten fattening cattle \$5 per head per month	\$300
Manure (bedding inclusive) 60 tons	50
	<hr/>
	\$350
Milk from 15 cows: 180 days, 10 quarts at 1½ cents.....	\$225
Manure. 50 tons.....	40
	<hr/>
	\$265
40 tons green fodder supplied to other cattle	86
	<hr/>
Total credit.....	\$701
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Balance to credit	\$175

Twenty acres under ordinary good pasture and seasons, will graze seven head of cattle.

Rent or value of 20 acres at \$3	\$60
Proportion of management.....	7
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	\$67
3½ fattening cattle for five months	\$50
3½ milk cows, 156 day, at 8 quarts	60
Estimate value of manure left	10
	<hr/>
	\$120
Credit balance.....	\$53

In the case of "soiling" a clear profit of \$175—and in that of grazing \$53—the one equal to nearly *three rents* per acre, the other hardly one rent.

I am handling a strict debit and credit account, and not speaking of so much flesh or milk revenue per acre, without charging what very few farmers do charge in estimating profits. All this, remember, without any help from bush or stubble pasture, and any roadside pickings—no meal, bran, or slops of any sort, but the plain produce of the soil in each case.

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Again, then, let us note that "soiling" in Canada means fully three times the profits of grazing, in addition to other considerations now to be examined.

SOME OF THE ADVANTAGES AND DISADVANTAGES OF SOILING.

1. Where land is a consideration there is a great saving of it by being enabled to maintain at least one cattle beast per acre in place of having to calculate on allowing three acres to graze one.

2. Were we to reckon by the amount of fodder produce (soiling or pasturing,) there is a large saving of food in avoiding destruction by cattle traffic.

3. Where we have apparently useless quantities of any kind of straw, chaff, and hay—good or poor in quality—they can be safely used in association with the moist green fodders.

4. We obtain fully double the quantity, and proportionately much more value of manure by soiling than by allowing it to have its own way in the field, the roadside, and the court. I am of opinion that were we able correctly to estimate the value of farm-yard manure in connection with this matter of soiling of cattle there would be no concern on the part of the farmer as to any other form of profit. He would simply be so independent as to be able to throw all beef and milk into the bargain, or allow them to stand as the mere overflowings of a system that puts him in possession of all the past and future wealth of his fields. Would the day were here when we all knew how to *make*, how to *preserve*, and how to *apply* our cattle droppings.

5. The larger produce of flesh and milk, on an average.

6. Gives greater variety of materials, allows uniformity in management, which gives greater comfort and health, and less liability to accidents.

7. But it requires greater care and intelligence to establish and maintain such a variety of crops; so, if this is to be put up as an objection to the system, we had better say beat at once. When any farmer begins to speak about "troubles," and first expense, and too much looking after of things, then the sooner he falls into the ditch the better; let him continue his successive crops of wheat, and give his cattle the range of all the farm, so as the earlier to convince him of the high life he is leading—an extravagant, selfish life, as well as a dangerous one.

8. It is well known in soiling experience that cows give a greater flush of milk from good early pasture than from having the food taken home to them. The change from winter confinement to the rich and plentiful crop of grass, along with the easy conditions under which they obtain it, does this; were this grass rush to continue there would certainly be much less in favour of housing; but it does rarely keep up—and while there is not so much milk in April, May and part of June, there is a continuous flow, with no falling off through July, August and September.

MANAGEMENT IN CROPPING OF GREEN FODDERS—CHARACTERISTICS OF THE SEVERAL PLANTS.

1.—SOILS: Limey, deep, dry, *rich subsoil*.

2.—SEED: Lucerne, 20 lbs.; sainfoin, 3 bushels; red clover, 20 lbs.; rye, 2 bushels; tares and oats, 2 to 1 bushels; millet, 1 bushel; corn, 3 bushels; rape, 8 lbs.

3.—CULTIVATION: Broadcast, drilling, horse-hoeing.

4.—MANURING: Liquid, special, farm-yard manure.

5.—ESSENTIALS: A rich soil, moisture and heat.

MR. FRANCIS MALCOLM'S EVIDENCE.

FRANCIS MALCOLM, a member of the Commission, tendered the following evidence on the subject of drainage.

PRACTICAL EXPERIENCE IN DRAINING.

He said—I do not know that my ideas will correspond with those of scientific men who have written on this subject, but I have had a good deal of practical experience in under-draining for the last nine or ten years, and have studied the subject considerably. I fully agree with all that has been said by previous witnesses on the importance of under-drainage to the agriculturists of this Province. At the same time it is to be lamented that there is so much ignorance on the subject among farmers; I do not mean that they lack intelligence, but their ignorance arises from want of experience.

INFORMATION OFTEN NOT PRACTICAL.

As a rule, the instructions given in books are too elaborate, scientific, and theoretical, for the general farmer to put into practice. If he does not get something that is very simple and easily understood, he will do nothing but plod along in his old methods.

A THOROUGH KNOWLEDGE OF THE FIELD—OUTLETS.

The first thing a farmer should do is to obtain a thorough knowledge of the field as regards its conditions at different seasons of the year. He should then inquire what are the natural conditions as regards outlet and fall that will admit of it being drained. These conditions vary very much. In some fields it will be very easy to get an outlet and a fall that are all he can desire, and in some it will be very difficult, and in others impossible.

THE SPIRIT LEVEL AND STRAIGHT EDGE.

However, this may be ascertained by the use of a good spirit level and a straight edge, say eight feet long, the centre of which should be bolted, or attached by a clamp, to the side of a nicely painted hardwood stake, five or six feet long. By driving this stake into the ground at any desirable point on the line of the intended drain, the straight edge so attached may be easily turned to the exact level, while by one sighting to a measuring pole held by another person, at another point of the intended drain, a knowledge of the lay of the land may be obtained, and the best possible outlet found.

THE WANTS OF THE FUTURE TO BE CONSIDERED.

A consideration of very great importance should be mentioned here, and that is, that in commencing to drain, every step taken should be considered as the foundation of a system of more thorough drainage at some future time. Every tile that is laid should be at a depth, and of a capacity, that is not only sufficient to carry the water from the land lying near, but the water that must come through this outlet from more distant points, at, it may be, some future time.

A GOOD OUTLET NECESSARY.

The first thing then to consider is the *outlet*, and this is of such importance that too much pains can hardly be taken to get a good one. To the drains above, it is as important as a good foundation is to a building. Success depends upon it. It is therefore the most economical in the end to commence with a good one, even if it should cost a good deal of trouble. What I mean by a good one is a free exit for the water from at least a three foot drain.

[*Mr. Malcolm.*]

DIRECTION OF A DRAIN.

In regard to the *direction* a drain should take, no certain rule can be given, further than it should always be as far as possible along the lowest part of the field, so that lateral drains may be run into it from either side when desired. It is also important that as much of it as possible should be on a straight line. If the direction must change, on account of the lay of the land, it should be at angles, instead of curves.

CUTTING OUT THE DRAIN.

When the course of the drain is laid out, the plough should be run along the line and the earth shovelled back, and this repeated till all is done that can be done with horse power. Then, in order to make a perfectly even grade along the bottom, the following plan I have found to be excellent:—

FINDING THE LEVEL.

It simply amounts to this; the erection of a line five feet above where the bottom is intended, so that the eye may be used in making it horizontally straight. Drive stakes in pairs, one on each side of the drain, and nail a strip of board between them, the upper edge to be straight and level, and five feet from the intended bottom. If the drain is to be $3\frac{1}{2}$ feet deep, the upper edge of this board will be $1\frac{1}{2}$ feet from the surface of the ground. The distance between those sights will depend on the length of drain that is on a straight line.

FREQUENT TRIALS REQUIRED.

What is wanted is that the finisher of the drain should always have some two of the sights before him, and with a rod similar to the half of a carpenter's ten foot pole, try the bottom by setting it on end at every two or three feet, and sighting over the top, which should always correspond with some two of those horizontal sights.

A SIMPLE SUBSTITUTE.

The trouble of erecting those sights may be largely dispensed with by simply driving board stakes (the upper end being a few inches wide), at such points as will not interfere with the digging, such as in the outlet or beyond the point to be dug at either end of the drain. But the upper end must always correspond with the line—five feet above the intended bottom. I say five feet, but any height may be used that is most convenient to the digger. If his sights are six feet above the bottom, then his rod must be six feet long in order to correspond.

WATER AN INCONVENIENCE.

This plan of grading the bottom has become very general in the community where I live, and is found to be of great utility. I would therefore recommend it a trial, and especially if there is no water when the digging is done, which I think best. Water interferes very much with making good work. I like every tile after it is laid to bear my weight without sinking, and this cannot be done in soft places, in the presence of water, and the smaller the tile the greater the necessity for a solid bottom.

DRAINS ON SPRINGY LANDS.

On springy lands that are always wet, and difficult to dig, on account of the tendency to cave in, it is a good plan to partially dig in early summer, as deep as possible; when the water has stopped running dig a little deeper, and so on till the bottom is reached in the fall, before heavy rains.

[*Mr. Malcolm.*]

QUICK-SAND.

But perhaps the greatest difficulty in a large portion of the country to the making of good work, is the presence of quick-sand. Much of it is so fine and movable in the presence of water that it will find its way through the best joints that can be made with tile.

HOW TO COUNTERACT QUICK-SAND.

It is therefore necessary in such places that the drain be made **at a time** when there is no water present. It is also necessary in order to have a permanent drain, to dig out the sand two or three inches below the bottom, and fill up with clay, or other material that will not wash. This should be packed solid, and, after the tile is laid, it should be surrounded with several inches of similar material, and well packed. If this is done as it should be, those beds of sand, instead of being an injury to the drain, will serve a good purpose, in bringing water, as laterals.

SIZE OF TILES.

Probably the best size of tile for general use is three inches, but where there is considerable water, and especially if the land is very level, say one or two inches to the hundred feet, a larger size will be necessary. In deciding the size of tile these two conditions should always be taken into account, amount of fall, and quantity of water. Where the land is such that a good solid bottom can be obtained, two-inch tile, if well laid, in lateral drains of moderate length will answer every purpose. But in connecting laterals with the main, the discharge should not be on the same level, but through a hole on the top, made for the purpose, which can easily be done by lifting a tile and using a sharp tool.

DEPTH OF DRAINS.

According to my experience, the most economical depth for general draining is about $3\frac{1}{2}$ feet. Some writers say 4 feet, but the additional width that must be cut at the surface, in order to get the body in, to lay the tile properly, quite overbalances the advantage of this extra depth. For thorough drainage, at $3\frac{1}{2}$ feet, they must be a little nearer together.

GRADE MUST BE UNIFORM.

Another important feature in draining is, that the *grade should be uniform* from the outlet to the head, but the lay of the land is frequently such that this cannot be obtained without running too deep, as the drain goes back. If the upper part is 6 inches to the 100 feet, and the lower part 2 or 3, the danger is that silt will be carried down the steep part and lodge in the flat, and so choke up the drain.

CHANGES OF GRADE.

To overcome this difficulty, the change of grade should be made **at a certain point**; and, there below the bottom, a tank should be made of brick, the size depending upon the tendency to silt, and the amount of water. The tile above this cistern empties its water into it, and the one below carries it out, leaving the sand in the tank. This point is a favourable one to bring in laterals from both sides. But all those emptying in should be a little higher than the one below, in order to give free discharge. It will also be seen that the tile below should be considerably larger on account of the less fall, and consequently slow movement of the water.

COVERING THE TANK.

The tank should be covered with a flat stone, well packed around the sides with clay,
[Mr. Malcolm.]

and the place marked, so that it may occasionally be cleaned out. It may be marked by objects at different sides of the field, the diagonal lines between which cross each other at this point.

DRAINING TOOLS.

The kind of tools which I have adopted are those which have been approved of in the old country. The spades I have used for many years are made in Birmingham, and cost \$3.50 each. Many of our Canadian spades are entirely worthless, being weak and inferior in material. I have found it difficult to get a good scoop. The best kind I have seen was made from an old drag-saw, riveted by a blacksmith to a handle.

PERSONAL SUPERVISION.

A very important matter in drainage is the necessity of personal supervision. It is a common thing for farmers to have their drainage done by somebody else, at so much a rod. Probably one-half of the draining done in that way is simply the burying of the tile in the ground, so that in a few years the drain becomes entirely worthless. Every farmer should acquire a certain knowledge of drainage, and should personally supervise every rod of draining done on his farm. Every fall the drains should be examined, with the view of ascertaining whether the water has a perfectly free outlet.

SAND IN THE DRAINS.

To Mr. Brown.—The only difficulty I had during the last nine or ten years in the way of sand running into the drains, was last spring, when I had to take up a small quantity of drain and lay it again. I believe this success is owing to the method I have adopted in making my drains. Drainage is of little value if it is not well done. I think it will pay to buy the very best tools for the work.

COVERING THE DRAIN.

To Mr. McMillan.—I never put anything on the top of the drain except the soil. I make the joints close, and if the tiles cannot be made to fit by turning, I cut them with some tool. Where there is good under-draining there is no necessity for surface-draining at all.

INCREASE IN DRAINING.

I believe drainage has increased very much in the country. A few years ago there was very little tile made in the county of Oxford, and to-day there are several kilns within a radius of twelve miles of my farm, and they sometimes cannot supply the demand.

F. MALCOLM.

MR. D. CALDWELL'S EVIDENCE.

Sitting to take oral evidence, held at Galt, August 18, 1880. *Present*—Mr. BROWN (Chairman) and DYMOND.

DAVID CALDWELL, Galt, was called and examined.

SUBSOILING—A SUBSOIL PLOUGH.

To Mr. Brown.—I am a nurseryman. I have been in that line twenty-eight years in this neighbourhood. I commenced in Elora. I have been accustomed to subsoiling my land. The subsoil plough that I use is Watson's of Ayr. It moves the soil but does not turn it up. It follows the common plough, which goes to the depth of about nine

[*Mr. D. Caldwell.*]

inches. The subsoil goes in the bottom of the furrow eight or nine inches. The soil is stirred, say about sixteen to eighteen inches. The general character of the soil I have been subsoiling is clay loam, pretty stiff in the bottom. I find that there is clay, in places, that is very stiff; although it does not retain water it is so stiff that the roots of plants do not penetrate it, and anything that is growing upon it suffers badly from drought. By stirring up this soil with a subsoil plough the plants are enabled to obtain moisture, because their roots go deeper.

ANTIDOTE FOR DROUGHT.

We have had a series of seasons during which the country has suffered very much from heavy drought—not during the last few years, but in former years. It was on account of this that I was led to commence subsoiling six or seven years ago. It costs a good deal to subsoil, as the land that we have up here is a stony ridge, and the stones have to be turned out. We turn out everything that the second plough comes in contact with. I put my land through a rotation of cropping, and then seed it down to rest it, so that I have had on it turnips, potatoes, oats, wheat, trees and strawberries—all upon subsoiled land.

BENEFIT TO FRUIT AND TREES.

I find that the subsoiling makes a great difference in the strawberries. It is also a great advantage to the trees which grow on the land. A crop of apple trees, which it is considered should be allowed to grow four years before they are transplanted, I can grow in three years, by subsoiling, fit to transplant. I think all other crops benefit from it in just about the same proportion. The beneficial results have been, I think, more noticeable in trees than in anything else, for the reason that trees penetrate the subsoil more than grain crops, especially the pear, which is very deep-rooted. Droughty weather has not so much effect on land that is subsoiled, owing to the fact that the stirring of it up allows the moisture which is below to come up.

COMPARISON OF RESULTS—EFFECT ON WHEAT.

I arrive at my conclusions as regards the benefits derived from subsoiling, by comparing the results obtained on land that was subsoiled with those on land which was not. I find that it is about equally as beneficial to wheat, and all other crops, as to trees. We are now cutting a heavy crop of clover, seeded down this spring, on where fall wheat grew. In the old country my father was a farmer in Ayrshire, and I remember the first thing he did on some of his land that he improved was, thoroughly to drain and then subsoil it, and that made new fields out of land that was comparatively worthless. My land here is naturally dry.

RIPENING OF GRAIN.

I find that grain does not ripen so quickly on land that is subsoiled as on land that is not; it hangs out longer, and the grain fills better. We sold some oats to the miller here, D. Spiers, and he said they were the best that came into the mill. The skin was thin, and the straw was bright and nice. This season we have sold our fall wheat at \$1.06, when the most of the wheat round only commanded \$1.00, \$1.02 and \$1.03—the same kind of wheat. I attribute that difference very much to the subsoiling. I am very particular about having bright, clean seed, and there might be something in that.

USE OF ASHES.

I have not manured anything extra. We have been manuring heavily with ashes. We get them all from the ashery here—leached ashes. I have an idea that ashes mixed with manure eat it up or dissolve it, and thus waste it; I do not know whether that is so or not.

[Mr. D. Caldwell.]

COST OF SUBSOILING.

The cost of subsoiling per acre is just double that of common ploughing. We have never put more than one span of horses to the subsoil plough; it requires two-horse power the same as the common plough. The expense is just the same where there are no stones. There is no danger of the poor subsoil coming to the surface, as it only stirs but does not turn it up. The cost of a subsoil plough is about eight or ten dollars. I have never had experience in subsoiling on other soil than such as my own.

WHERE SUBSOILING IS NOT NEEDED.

I would not advise every farmer to subsoil; I would advise the farmer that has a sandy subsoil not to subsoil-plough, because his land is porous enough already; but where there is a good subsoil, clay loam especially, I would advise it. I think there is no improvement that could be made at less cost, and it is a permanent improvement.

NECESSITY FOR SUBSOILING.

Looking at the fact that the larger number of farmers plough at a certain depth, and that they keep the plough going at that depth for several years, I think it would be a good thing for them to subsoil where possible. Through the horses' feet treading on it and the sole of the plough running on it that becomes packed like a road, and the roots of plants cannot penetrate it. The moisture is retained longer in land that is subsoiled, because the soil is made deeper in that way. I have grown turnips on my subsoiled land that were perfectly astonishing. They were later than turnips I had sowed elsewhere; but there was a third more bulk. They kept their greenness longer than the others, and they were large and sappy.

METHOD OF MANURING—COMPOST—SWAMP MUCK.

I would recommend applying manures pretty much on the surface—not leaving them on the surface, but putting them on and then turning them in with a gang plough so as not to bury too deep. This I would do after fall ploughing. I think manuring has had a better effect with me in consequence of the subsoil ploughing; I have given the credit to the subsoiling more than to the manure. The rootlets of plants can ramble more, and get more nourishment in land that is subsoiled than in land that is not. I generally make muck compost as far as possible. I have used swamp muck largely. I have taken it out of swamps and pond holes wherever I have been able to get it from this time in the year on to the fall, and emptied it out anywhere that was most convenient, let it remain there during the winter exposed to the frost, and then used it next summer in the way of compost mixed with barn-yard manure and ashes. I have found it a great benefit to apply it, owing to the fact that our soil here lacks vegetable matter. I put on about fifteen loads of the compost to the acre. In the mixture I have generally put about two loads to one load of manure, and perhaps a load of leached ashes. I would use muck all the time as a compost. I apply it just the same as I would farm-yard manure, and I find in digging around our trees three or four years after putting it on, that there is more of it to be seen than of any other manure. I tried muck before I subsoiled, and found it beneficial even then. There is nothing that will improve clay soil more than muck, because it keeps it open and porous.

DAVID CALDWELL

[Mr. D. Caldwell.]

ONTARIO AGRICULTURAL COMMISSION.

APPENDIX H.

EVIDENCE

RELATING TO THE VARIOUS

BREEDS OF CATTLE AND SHEEP,

AND TO

WOOL, PIGS AND PORK PACKING.



HEREFORD BULL.

ONTARIO AGRICULTURAL COMMISSION.

APPENDIX H.

EVIDENCE

RELATING TO THE VARIOUS

BREEDS OF CATTLE AND SHEEP,

AND TO

WOOL, PIGS AND PORK PACKING.

Sittings to take oral evidence held at Guelph, July 13th and 14th, 1880. *Present—*
Messrs. W. WHITELAW (Chairman), W. BROWN and A. H. DYMOND.

MR. F. W. STONE'S EVIDENCE.

FREDERICK W. STONE was called and examined.

HEREFORDS—COTSWOLDS—SOUTHDOWNS.

To Mr. Whitelaw.—I have been a breeder of Herefords for a number of years. I first imported them in 1860. I find them very well adapted to improve the common stock of the country—probably equal to the Durhams.

EQUAL TO THE DURHAMS.

I consider them quite equal to the Durhams as regards hardiness and ease of being kept. I think they will arrive at maturity as soon as the Durhams, and that on the same kind and quantity of food they will produce as many pounds of beef.

GOOD BEEFING QUALITIES.

A cross of the Hereford on the common stock of the country would produce as good a steer at three years old as the Durham, and as much weight.

THE BEST GRAZERS.

I think the Herefords are the best grazers of any of the existing breeds. It is not to my interest to say so, but I believe that is the case.

GOOD AND RICH MILKERS.

Some of them are very good milkers. There is no doubt that their milk is richer than that of the Durhams, and although they might not give so much during the first month or so, many of them will continue to give an even quantity for a longer period. They might not give so much at one time as the Durham, but taking a number of months together they will give as many quarts.

[*Mr. Stone.*]

MARKET IN THE STATES.

I find a ready sale for all I can raise. My chief purchasers are from the United States. They are not known sufficiently here to be appreciated.

GOOD VOYAGERS.

I think they are a valuable class of cattle for the production of grades for shipment to the Old Country. They will stand the voyage better, with the same usage, than the Durhams. If you take twenty-five or fifty steers of Durhams and the same number of Herefords, and treat them in the same way, giving both the same quantity of feed, I think you would find that either the thoroughbred or the grade Herefords would equal the Shorthorns. In stall-feeding I think you would find that the Herefords at two years old would show more improvement than the Durhams, and at three years old they would be superior for shipment. I have not had much experience with shippers, and I do not know whether they prefer them or not; they would prefer them, I suppose, if they were to be had, and better beef cattle.

PREFERRED BY BUTCHERS.

I know the butchers prefer them. I have had Hereford cows that have weighed as much as 1,600 to 1,900 pounds, according to their age. I have not been much in the habit of feeding for ten years.

FINE GRADE STEERS.

Some ten years ago I fed three grade steers. They were in the stalls but about eight weeks, but I used to give them meal every day in the pasture, and when they were between two and three years old I sold them in Guelph, and they weighed 1,650 pounds each. Before they were sold they had not been in the stalls for over eight weeks, but we gave them four or five pounds of meal each day, and they were very nice cattle. Since that time I have not fed any; I am a breeder and not a feeder. I have kept both Herefords and Durhams, and I consider that the Herefords can be kept more easily than the Durhams, particularly on pasture.

HEREFORDS SURE BREEDERS.

To Mr. Brown.—The Herefords are as sure breeders as the Durhams, and surer at the present time, because the Durhams are over-fattened for show purposes. A great deal of the stock of the country has been injured by being over-fed for the purpose of exhibiting them at shows.

HEREFORD CALVES.

The Hereford calves, I think, are as good or better at six months old than the Durhams, owing to the superior quality of the Herefords' milk. If I were not breeding pure-bred stock exclusively I would use a Hereford bull, rather than a Durham, to cross upon the common cattle of the country.

HEREFORDS THE BEST ON PASTURE.

If I had a three-year-old Durham grade and a three-year-old Hereford grade in the spring, and they both weighed 1,500 pounds, and if I put them out at pasture on the 1st of May, I think the Hereford grade would come out on the 1st of October in better condition than the Durham. The Hereford would give more prime beef and less offal. When they went to the shambles the Hereford would give better cuts. As a rule, my Herefords

[*Mr. Stone.*]



HEREFORD OX.



SHORTHORN OX.

are just as quiet and docile as the Durhams. Taking them at the same age and under the same conditions, and giving them equal quantities of food, I think a Hereford, on stall-feeding, would come out better at three years old than the Durham.

EARLY IMPORTATIONS.

To Mr. Dymond.—I was engaged in agriculture long before 1860. I commenced importing Shorthorns in 1853. My only reason for importing Herefords was that there were some miserable ones in the country, and I brought in some improved stock. In 1860 I imported eight, and I think they have improved very much since that time.

DURHAMS MORE FASHIONABLE.

The reason the Durham has been preferred before the Hereford or other breeds is that it is more fashionable. I don't think its fashionableness is founded on argument; I think many fashions are very ridiculous. Herefords are more in demand now than they were. Taking fifty together, we got more money during the last two years for the Herefords than we did for the Shorthorns, though we might get more for some individual Shorthorns than for Herefords. The demand in proportion has been greater for Herefords than for Durhams during the last two or three years. That is owing to the demand which has sprung up in the west for cattle for grazing purposes.

IMPROVING WESTERN CATTLE.

These cattle are taken out west, to Colorado, Texas, Kansas, and other States, to improve the common stock. The age at which these cattle are purchased depends on where they are going to. The Texas and Colorado men would like to have them at from ten to eighteen months old. We sold nothing last year under \$200. What makes these people prefer the Hereford is that they can get half a cent a pound more on the market for the steers of the Herefords than they can for Durham steers.

OBJECTIONS TO THE SHORTHORN.

The difficulty with the Shorthorn is that it gets too bony and too tall. In these western countries they have nothing but pasture, and the Hereford thrives better on it than the Durham.

AN EXPERIMENT.

Eight or ten years ago a gentleman came over here to buy a car load of Shorthorns. I sold him several heifers and bulls, and I urged him to take a Hereford out with him; at first he would not hear of it, as Herefords at that time were not in so good demand as they are now; but finally, at my recommendation, he took a heifer and a bull; and I got a letter from him last year, and he said that from that heifer he had about thirteen female descendants, that there was such a demand for half-breed Hereford bulls that he could not supply it, and that he was then breeding about 500 heifers. In Kansas city, this gentleman told me, he gets half a cent a pound more for the half-breed Hereford than for the half-breed Durham. The cattle there are not stall fed; they are all grass fed on pasture. They bring their cattle to Kansas City at two or three years old. In Colorado they don't grow corn, but in Kansas they do. The particular States to which I have sent my Herefords and Shorthorns are Ohio, Michigan, Maryland, Illinois, Missouri, Colorado, Kansas, Indian Territory, and Maine.

GRADE CATTLE.

I don't raise grade steers, and I cannot say from my own experience what is the best class of grade animals. The men out west are better judges of the qualities of grade cattle.

[*Mr. Stone.*]

A GOOD DEMAND FOR BULLS.

There was a gentleman from the Indian Territory at my place this spring. He had written to me, saying that he wanted about 40 or 45 grade bulls. I told him that if he came I could let him have between 18 and 20 Shorthorns and Herefords; and when he came he was satisfied, and took both the Shorthorns and the Herefords at my own price.

VARIATION IN MILKING QUALITIES.

There is a variation in the milking qualities of the Herefords—both of animals and families. I keep importing thoroughbred animals from time to time from the old country. Last year I imported 32. I think my stock are as good now as they were when I first imported them. I can turn out a better Hereford bull now than I could then. We only pay our attention to breeding them, and selling them as pure-bred animals. We hardly ever milk a cow, except when one gives more than its calf takes. The calves are our milk maids. I have not found any deterioration in the health or vigour of the Herefords.

HEREFORD HERD BOOKS.

The Herefords are not mentioned in the Canadian Herd Book: it is for Shorthorns exclusively. In England there is a herd book for Herefords, and we enter all of ours in the English Herd Book. They are trying to get up an American Hereford herd book out west, but I shall not enter any in it. I have not taken any steps towards getting them entered in the Canadian Herd Book: I am quite satisfied to have them entered in the English Herd Book.

THE CANADIAN HERD BOOK.

I enter my Shorthorns in the Canadian Herd Book. It is pretty fairly conducted, though there are some animals entered in it that should not be there. There are some in it that are not so good as an animal with four crosses. But the Canadian Herd Book was begun on a wrong principle, and it cannot be put right now; that is, the principle of admitting an animal that had a doubt about it. I also enter in the American Herd Book. I did not enter in the last volume of the Canadian Herd Book because I did not know anything about it.

A CASE FOR DISCRETION.

It would depend on circumstances whether a farmer of average means should use a Durham bull or a Hereford bull to improve his common stock. It would not be advisable for a farmer at the beginning to keep thoroughbred stock at all—I mean when he is commencing on a new farm with small means. If he had good pasture he might use the Hereford, or he might use one at one time, and another at another time; it depends altogether on circumstances. A great many Canadian farmers have not pasture, and they would have to fall back on artificial food. I would not even then recommend the Durham as preferable to the Hereford, though I have a great deal more interest in Shorthorns than I have in Herefords.

CHOICE OF SHORTHORNS.

I had the Shorthorns first. I invested too much in them altogether. The Shorthorn families I prefer most are those I have got. Fashion influenced me to some extent in my selection. For the general purposes of this Province, I think a mixture of Bates and Booth blood would be the best. I don't mix them, because I have to keep them separate for breeding purposes.

To Mr. Whitelaw.—The cattle for which fancy prices are paid I don't think are any better for the purposes of the Canadian farmers than others.

[*Mr. Stone.*]

A GOOD CONSTITUTION NECESSARY.

A farmer ought to breed cattle with a good constitution, no matter what breed they belong to. It has been the same with sheep and pigs and all other animals, that people would not look at them unless they had such and such a pedigree. One of the best judges of Shorthorns in England was vexed when he heard that I had bought eight Herefords. He said it was an injury to me, and I ought to know better. I told him I was not so prejudiced as that. These fancy prices are just kept up by a few persons who are able to pay them. In 1853 I could have bought the very best of these fancy cattle for £600.

COTSWOLDS AND SOUTHDOWNS.

I am a large breeder of sheep. I keep Cotswolds and Southdowns at present; at one time I also had Leicesters. I just keep them for breeding purposes. Our best market for sheep is in the United States. We used to sell every year by auction. Canadian farmers bought pretty largely; they went better into sheep than into cattle.

CHOICE OF BREEDS DEPENDENT ON CIRCUMSTANCES.

I find the Cotswold a valuable breed of sheep, and easily kept. What class of sheep or cattle a farmer should keep depends greatly upon his circumstances and upon the nature of his farm; in some places the Cotswolds are best, and in other places the Southdowns are best. The Southdowns are a much more active sheep, and are more adapted for hilly countries than the Cotswolds. In this section of country I suppose I was the first that imported any Cotswold sheep. At first I had great difficulty in getting any person to look at them; but I think they are appreciated more by the Canadian farmers now than they were a few years ago. Where there was one Cotswold kept twenty years ago, there are a hundred kept now.

LEICESTERS.

I was once foolish enough to import a lot of Leicesters; I lost a lot of money on them, and I sold them all out. I imported them from the best flock in England, but people here said they were too small for this country. A coarse-bred sheep would sell here for twice as much as a pure-bred Leicester. The Leicester sheep do not command the highest price in England now; I have seen sheep sold at a 100 or 125 guineas each, and they were not Leicesters.

THE SOUTHDOWN'S MERITS.—A GOOD CROSS.

The Southdown is a valuable sheep, and easily kept. A valuable sheep for the old country market would be a cross of a Southdown ram upon a grade or Leicester ewe; but I believe that somebody should always keep pure-bred sheep. Cotswolds, Southdowns, Leicesters, and Lincolns are all very valuable sheep; Shropshire and Oxford Downs are only crosses.

PURE-BRED RAMS INDISPENSABLE.

To Mr. Brown.—I would advise the Canadian farmer to select a breed of sheep according to the nature of his farm. If he has good common sheep, let him buy a good ram of some kind; I should always use a pure-bred ram. I have no preference, as to sureness of breeding or prolificness, between the Cotswold and the Southdown.

[*Mr. Stone.*]

KEEPING UP THE WOOL.

We find it difficult to keep up the same quality of wool here as they do in England; our climate is too dry and hot. I fancy that the Southdown would keep up the quality of its wool better than the Cotswold in this country. If the farmers would use a Cotswold ewe with a Shropshire or Southdown buck I think they would have better wool.

DEMAND FOR SHORTER WOOLS.

But now there is not so much demand for wool of the length that there formerly was. With the machinery now in use, wool four or five inches long can be worked as well, provided it has the same texture, as that eight or twelve inches long. I am quite satisfied that if I had a large quantity of wool from a cross of a Southdown on the Cotswold, I could command three or five cents a pound more for it than for the very coarse wool of the other breeds.

THE CLIP OF WOOL.

To Mr. Whitelaw.—I don't think that cross reduces the quantity very much. I have seen some fleeces in which the wool, though not so long, was thicker. The weight was pretty nearly the same. The quantity of wool depends very much on the weight of the sheep.

To Mr. Brown.—The tendency of the market is at present towards shorter wool; there is a better demand for Southdown wool now than there has been for some time.

EARLY MATURITY DEPENDENT ON FEEDING.

As to early maturity, a great deal depends on how you feed your sheep. We do not have much disease among sheep in this country. We have had the least trouble with the Southdowns; we have not paid, or required to pay, that attention to them that we did to the others. I think the Southdowns are the best nurses.

WINTER TREATMENT.

In the winter time the sheep are too much confined in this country; it would be better if they were allowed to be more in the open air. I would leave them outside, and let them have plenty of exercise, until the lambing season came on. Our ram lambs last year, although they were allowed to run out of doors last winter, did very well. In all these things I judge very much by the habits of the animals. In hard, dry, freezing weather the sheep like to be out on the snow, but not in stormy weather, and I believe they are better to be outside than to be shut up.

TREATMENT OF BREEDING EWES.

To Mr. Whitelaw.—I do not feed turnips every day to the breeding ewes. Last year we stopped doing so, and I think we had better luck. If we give them turnips, we may feed them an odd one or two, but that is all. We give them bran sometimes. I think turnips are bad for breeding ewes if you allow them to eat all they can. They are likely to gorge themselves, and that injures the lamb. I do not give them grain very often; but, about a week after lambing, we of course feed them turnips and grain (oats and peas) and it won't hurt them.

A GOOD SHEEP FOR THE COUNTRY.

To Mr. Dymond.—I would recommend a cross of a Southdown ram and Cotswold ewe as a very good sheep for this country. The only disease I have had among my sheep was the foot-rot, some years ago, among the Cotswolds. I think I had Southdowns at that time,

[*Mr. Stone.*]

but they were kept separate. The disease was not generated in this country; they must have brought it from the old country. Generally speaking, I regard this country as very favourable for sheep in point of health. I agree that keeping sheep in a yard in winter, with a shed for shelter, would be preferable to shutting them up.

THE OXFORD DOWN.

I am acquainted with the Oxford Down. If you cross the Cotswold on the Oxford you would not get so fine a sheep as if you used the Southdown on the Cotswold; you would get a coarser and larger sheep. The Oxford Down is a good mutton sheep. Within the last few years it has been established as a separate breed.

SPOILED BY BAD FEEDING.

A great many sheep have been spoiled in this country. A great many people had some nice Southdowns, and they did not like them because they were small. They ought to have fed them better. Their popularity, I think, has been increasing of late.

LARGE ANIMALS PREFERRED BY SHIPPERS.

I don't think they are preferred by the shippers because they cannot make so much money by taking them to England as they can with larger sheep. What the shippers make in the better quality of the mutton they lose in the cost of transporting, as it costs as much to take a small sheep to England as a large one. The shippers want sheep weighing 200 pounds or over—they want a large animal. It is just the same with steers—they want steers that will weight 1,650 pounds, rather than those that will weigh only 1,250 pounds, as it costs the same to take them over.

FOUR-YEAR OLD STEERS.

I think it would pay the farmer to keep his steers until they are four years old. I think they ought to breed their cattle in October or November, although that is contrary to the opinion of most people. I would make the first year's feeding the grand work, and, instead of keeping them the fourth winter, I would get them as heavy before the fourth winter as many would have them in the following spring.

To Mr. Whitelaw.—If a farmer can bring a good Durham steer to weigh 1,600 pounds at three years old, nothing will be gained by keeping him for another year; but if he can bring him to weigh 2,000 pounds by keeping him another winter he can make more money out of him. The question for the farmer is, How can I make beef the cheapest per pound? A farmer could not keep so many cattle if he kept them all till they were four years old.

TIME OF CALVING.

Most of the farmers will not have calves come at any time but in April or May; but if you have them dropped in the fall, and feed them well during the first winter, you can turn them out to pasture in the spring, and you save the wintering of them in their last year to make them the same weight in the spring as they are in the previous fall. The quickest return you have for your outlay is generally the best, and a good foundation for a young animal is better than any attempt to feed him up afterwards. Stunt a young animal, and you can never get him forward again.

PURE-BRED LEICESTERS.

To Mr. Brown.—I gave up the breeding of Leicesters because people would not buy them pure, owing to their smallness. They were not Border Leicesters that I had. I

[*Mr. Stone.*]

got rid of them all, because, as the country would not be satisfied with the size of the pure breeds, I would not cross them to please them.

BORDER LEICESTERS.

Mr. Whitelaw, Mr. Smith, and some others have imported Border Leicesters. Those who keep them claim them to be a distinct breed. I don't know anything about their origin.

A LARGE HERD OF SHORTHORNS.

Individually I am the largest breeder of Shorthorns in Canada. I have much more interest in Shorthorns than I have in Herefords. I have about 160 Durhams and 120 Herefords. I have no question in my own mind as to the great utility of the Shorthorn as a means of improving the stock of this country; at the same time, the Herefords have not been used in this country to the extent that they ought to be. I think the Hereford would mature a little earlier, at the same cost, than the Shorthorn, although the latter would be the larger animal. I could not say which would ultimately be the finer beast, if you went on feeding them for four or six years, as it would depend on whether people would prefer weight or shape. The Hereford is rather a smaller boned and more compact beast than the Durham at the same weight. I think the Hereford would be as heavy at three years old as the Durham of the same age and upon the same feed. I think a grade Hereford at three years old would be equal to a grade Shorthorn of the same age, upon equal feed.

FREDERICK WM. STONE.

MR. McCRAE'S EVIDENCE.

GALLOWAYS—COTSWOLDS—LEICESTERS—SOUTHDOWNS.

THOMAS McCRAE was called and examined.

HARDINESS OF THE GALLOWAY.

To Mr. Whitelaw.—I have been acquainted with Galloway cattle for forty-five years. I think they are well calculated to improve the common stock of this country in regard to beef. I have never seen or known any hardier cattle, with the exception of the West Highlanders, and so far as early maturity is concerned they are very nearly on a par with the Durhams. If kept on pasture during the summer, and good food during the winter, they will beat the Durham; but if house-fed, I think the Durham will beat the Galloway in weight. The Galloway cattle are far sharper on their feet, and constitutionally stronger than the Durham cattle.

GALLOWAY GRADES AT THREE YEARS.

A cross from a Galloway bull and a common native cow, if fed till it is three years old, will weigh from 1,600 to 1,700 lbs. I have five three-year old Galloway steers at present which I have been offered \$100 apiece for, if fed for six months. I have had Galloways at two years and a-half weighing 1,500 lbs. With regard to their milking qualities, we do not breed them for milking purposes, but the best milking cows we have had of any breeds have been Galloways; still, these are exceptions, and not the rule. We use them for breeding purposes, and let them nurse their own calves, which destroys any cows for milking. I consider the Galloways a good hardy breed to be kept distinct. Their beef is reckoned to be of the very best quality—equal to that of the West Highlander. Some Galloway grades which were taken from the township of Nichol in England were sold for £3 a head more than other beasts—Durham grades—same weight.

[Mr. McCrae.]



GALLOWAY BULL, "BLACK PRINCE"—(OWNED BY THE DUKE OF BUCCLEUCH.)

SUPERIOR BEEF.

In England a Galloway will command a higher price than a Durham, weight for weight. I think I read once in the *Mark Lane Express* the statement that it was no new thing for the Galloways to bring from £2 to £3 a head more than an animal of equal weight belonging to another breed. We have found plenty of sale for all we raise. We sell them for breeding; but when they come to a certain age, if not sold for breeding, we feed them, and as beef cattle they bring as much in proportion as the Durham. I think the Galloway is much more easily kept than the Durham. For instance, on my farm of 120 acres I have 40 Galloway cattle out at pasture, besides 21 sheep, 6 horses, and a number of pigs. I can keep all that stock summer and winter on that farm.

CROSSES WITH THE DURHAM.

To Mr. Brown.—We are in the habit of keeping other cows for milking purposes, and we have crossed the Galloways with them; we have also sold a number of bulls in the neighbourhood and throughout the country, and they have been used with very fair success for crossing with other cattle. The cross of a Durham bull on a Galloway cow is fully as good as the cross of a Galloway bull on a Durham cow. When I speak of the Galloways being hardier than the Durhams, I do not mean that they can do on less food, but on a coarser kind of food than the Durhams.

WINTER FEED—VALUE.

In the winter we feed our Galloway cattle on turnips and straw until the month of April, and we find that they do well on that. It would cost about one-fourth less to bring a Galloway steer to weigh 1,500 lbs. than a Durham steer; in feeding them together I have found that to be very near the proportion. I do not think I could obtain quite the same flesh on the Galloway at three years old as I could on the Durham; the Durham might weigh from 100 lbs. to 150 lbs. more. The steers for which I was offered \$100 apiece weighed over 1,200 lbs., and were a little over two years and a-half old. A gentleman from England was at my place, and going over the farm and looking at the cattle, for the first one he saw he said, that, if I would feed him for six months and make him fat he would give me \$100, and when he saw the rest he offered me \$100 a head for them if I would feed them for six months. He was from the county of Durham, in England, and he came to this country for the purpose of buying cattle for the English market.

GOOD BREEDERS.

I have never had any difficulty with them as breeders. I have been breeding them for eighteen years, and during that time I only had one cow that did not breed, and during all that time I have never lost a calf by abortion. The only calf I lost was lost in consequence of its mother getting hurt while coming home from one of the exhibitions; and, so far as my memory serves me, we had only one calf during that time that did not come to maturity. We top off our Galloways by feeding them plenty of good pea-meal and a little bran. This year, I think, we got two or three hundred-weight of oil-cake, and I think we have about one-third of it left. The only way I know of to make shippers aware of the good quality of the Galloway beef is to raise the cattle well, and when they take them home they will become very well aware of it.

ADVANTAGES FOR SHIPPING.

To Mr. Whitelaw.—I think the Galloways are decidedly superior to the Durhams for standing the hardships of the voyage across the Atlantic. They will arrive on the other side in a much better condition than the Durham. It will take a great deal to throw a

[*Mr. McCrae.*]

Galloway off its feet. The absence of horns is a great advantage, both on the ship and on the farm. On the farm they will lie together in the field like a flock of sheep.

PARTIALITY FOR GALLOWAYS.

To Mr. Dymond.—My attention has been chiefly directed to the Galloways. I was brought up with them in Scotland, and it was that which first led me to select them as my favourite breed. I imported some from the old country, and I had no doubt as to the purity of the breed. Every animal that I have has been either imported or directly descended from imported stock. I intended to import a bull and two cows this year, and had agreed for them, but the three months' quarantine at Quebec prevented me; but my stock has been replenished from time to time by imported animals. I have not practised in-breeding very much; I do not approve of that beyond a certain extent. I do not think my herd has deteriorated in consequence of in-breeding. I think I have animals now as good as I ever had, and they are as good as any original Galloways.

BETTER SUITED FOR THE CLIMATE.

I think the Galloway cattle suit the climate of Canada very well; neither the heat of summer nor the cold of winter injures them. They are far better haired cattle than the Durhams, and suffer less from the cold. I have had some experience with Durhams; I have none at present, and do not mean to have any more. Even if I thought Durhams were as profitable as Galloways I don't know that I would cultivate them, for I am very fond of Galloways,—I like the cattle without horns. They are far more docile than the Durhams, although they get the name of being cross. We have one a little cross this year, the first we have had for eighteen years. I think the Galloways are a distinct breed from the Polled Angus. I have never had any Polled Anguses, and I can only speak of them from what little observation I have had. In appearance they are something similar to the Galloways, but to me they are as distinct as a red and a black animal. I do not think they or any other cattle are superior to the Galloways.

MARKET FOR BULLS AND HEIFERS.

I have a ready market for all the pure-bred Galloways I raise. This year we have sold, I think, three bulls in Canada, and we have had several applications for others. One man came all the way from Iowa and he bought five, but he could not get them over, so he has left them with us. We are in treaty now with several people on the other side for bulls and heifers. I think some thing like fifty altogether have gone to the other side.

SUITABLE FOR SMALL FARMERS.

I would recommend the Galloway as being adapted to farmers of the smaller class, with whom feed is an object, and farmers whose land is somewhat rough. I would recommend the Galloway as an animal particularly well adapted from its hardiness for the rougher districts of the Province. They will do well on rough kind of food that a Durham would just live on and no more. Of course, they won't do so well on rough feed as a Durham will on good feed, but they will do on less. I have not had much experience in shipping cattle. Until lately we have never fed any fat cattle, but kept them for breeding purposes; but for the last three years we have fed from eight to ten cattle.

GRADE STEERS.

I have obtained some very good steers from crossing Galloway bulls on our native cows, and in 90 cases out of 100 these steers are without horns. I have always sold these grade steers at a price equal to that obtained by Durham grades. A dealer once

[*Mr. McCrae.*]



GALLOWAYS.

raised the objection against the Galloways that their legs were very short, and that they did not stand up so well in a crowd as the Durhams, but there is no objection to them in that respect when they are sold by weight.

GALLOWAYS AS MILKERS.

I think that by carefully selecting the Galloways we could secure from them as good a race of milkers as exists. The Galloways are better milkers than the race of Shorthorns about here at the present time. I think a herd of Galloways would produce more milk, and milk of a better quality, than a herd of Shorthorns. I don't think they are such good milkers as the Ayrshires, but they are better for beef. We had a Galloway cow that, after nursing her calf for six months, and being fed only on pasture, produced ten pounds of butter in seven days. The reason the Galloway beef is more popular in England than the Durham beef is, that it is of finer quality, and has a better mixture of fat and lean. I account for the popularity of the Durham by the fact that it has been brought out to this country and has done very well, so that it has now become fashionable.

PREJUDICES AND THEIR CAUSE.

What prejudiced the Galloways in this country was, that at first a pair of Galloways were brought out which were not pure. These cattle and their descendants prejudiced the breed very much. Mr. Sproat, who came from Galloway, near to where I was brought up, got some of the descendants of these cattle, and the first calf he got was red, and that told a tale. I do not usually buy any feed for my cattle, but keep them all from the produce of my farm.

FARM PRODUCE KEEPS THE CATTLE.

Last winter we kept forty cattle; we bought ten tons of hay, and we had between seven and eight tons left. The farm keeps the cattle. I have not bought any coarse grains this year. I formerly bought corn, but have bought none since the National Policy came into force.

CROSSING WITH THE DURHAM.

The cross from a Durham bull and a Galloway cow did not bear the Durham type in anything but the horns. It was black with a white hair here and there in it, and it was what an Englishman would call "a dark blue-grey." I also crossed a Galloway bull with a Durham cow, and obtained a red heifer without horns. I have seen the Norfolk cattle, which have no horns. There used to be some of them in the county of Wentworth, but I don't know of any others.

GALLOWAY HERDS.

There are other large breeders of Galloways in Ontario besides myself. Colonel Skinner has thirty or forty; Develin has a large herd, Wilson has a number, and Eddy. A man in Maryborough got a bull and a heifer from us; and a man named Elliott, in Galt, has some. There are several herds in Quebec. I have exhibited my Galloways every year since I have kept them. I obtained some prizes. They were prizes for Galloways as a distinctive breed. This spring my bulls were put into competition with other cattle. The Hereford took the first prize, but there was a good deal of doubt whether I ought not to have got the first prize. I don't think it is a fair thing to put one breed against another breed. I have never exhibited a fat Galloway steer among the fat cattle at shows, but I remember some half-breeds which were shown at London and took prizes. If Galloways were excluded from prizes at Exhibitions I think they would still hold their own in the country.

[Mr. McCrae.]

SHEEP BREEDING—COMPARATIVE MERITS.

To Mr. Whitelaw.—I have been also a breeder of sheep to some extent. I have bred three distinct breeds, the Cotswold, the Leicester and the Southdown. I have representatives of these three breeds at present. I think the Cotswold, taking all its qualities into consideration, is the best breed for improving the common stock of the country. I think the Southdown is a very acceptable sheep for crossing with the common stock of the country in order to obtain an animal for exportation: you will get the best wethers from a cross of the Southdown with the native stock. The Southdown beats all the other breeds in early maturity. At a year old I think the Southdown would attain one hundred and fifty pounds. I don't think the Oxford Down would be a favourable sheep to cross with the common stock of the country. By using a Cotswold or a Leicester ram I think we could obtain a better animal for exportation than by using the Oxford Down. I think it decidedly desirable that the breeds should be kept distinct; I would not approve of the practice of using a Cotswold one year, a Leicester the next year and a Southdown the next year.

FREEDOM FROM DISEASE—WINTERING.

I have not found sheep to be liable to any particular disease in this country. I have not found any difficulty in keeping a large number in a flock, if there is room for them. In the winter I shut the sheep in every night, but I allow them the use of a yard during the day. I feed them in racks in the house. I have very seldom used ram lambs for breeding; I do not approve of breeding from a ram lamb at all. I think the Southdown crosses make finer mutton than the Cotswold, and they have much less inside fat than the Leicester, and are consequently better adapted for the taste of the English market; but you would get greater weight in the Cotswold. At fifteen months old you would get a greater weight of mutton from the Cotswold than from the Leicester, although the Leicester would have very nearly the same weight, owing to its having more fat on the inside. The Leicester has not so much fleece as the Cotswold. The average in a flock, I think, would be a pound less; our average for the last few years has been eight pounds and a half to the fleece.

To Mr. Brown.—My farm is a light, sandy loam. The Cotswold pays me better than any other breed of sheep; I have tried the three and can make the most out of the Cotswold. With a good selection of the common ewes, you would get a first-class lamb from a cross of a thoroughbred Cotswold ram, but if you use him for two years on the same ewe, the second lamb would be very much inferior. Under equal conditions the Cotswolds will keep up their fleece best. The Cotswold is a rougher feeder than the Leicester. I do not know which breed would maintain the stamp of the breed best by in-and-in breeding. I have had no experience of in-breeding sheep in this country.

To Mr. Whitelaw.—There have been a number of men who went in strongly for Leicesters and crossed them everywhere, but I am not sure that the Cotswold is not a distinct breed; if it has been improved it has been improved by the Southdown as much, if not more, than by the Leicester. The Leicester has certainly improved the sheep both in this country and in the old country, in certain districts very materially; but I am not quite clear that it has improved more than other breeds. My experience is that it is better to keep the three breeds distinct. I would never breed from a cross.

LEICESTER AND SOUTHDOWN CROSS.

To Mr. Dymond.—I would have no objection to crossing the Leicester and the Southdown for export purposes. The Cotswold crossed with the Southdown would make a strong, heavy sheep. I think a cross of the Southdown on the common sheep of the country would even make a more popular animal for the English market than a cross of the Cotswold. In such a cross you would get a spotted face, but Englishmen are not so particular about the colour of the face as they are about getting an animal that

[*Mr. McCrae.*]

has the most lean meat. The Leicester is on the whole a finer sheep than the Cotswold, but I believe the cross from common Canadian ewes with a Southdown ram would give as good a return as an export sheep as either the Cotswold or the Leicester.

To Mr. Brown.—I think, upon the whole, the Cotswolds have been the most prolific and the surest breeders, though I cannot speak very decidedly as to that. I have not bred very many Southdowns. The Cotswold has a stronger limb than the Leicester.

PRICE OF GALLOWAY BULLS.

To Mr. Dymond.—We have sold our thoroughbred Galloway bulls at from \$50 to \$200, according to the quality of the animal and the desire of the purchaser to possess it. The Galloways are not such fanciful animals as the Durhams, and there are no fancy prices paid for them in this country, although there are in Scotland. They fetch a truer value than the Durhams. I usually sell them at from fifteen to eighteen months old. I have a bull now that I would not sell for \$200, and I have none that I would sell for less than \$75. From being an animal that is easily kept, the Galloway is specially suitable for farmers with small capital. I had a letter not long ago from Scotland, which stated that a Galloway bull and two cows had been sold there for three hundred guineas each, but these prices were given by men who were willing to give fancy prices. I have kept Essex pigs for twenty years, principally for home use. They are a small breed, and being far more easily kept and less mischievous than other breeds, are better adapted for home use.

ROOT CULTURE.

To Mr. Whitelaw.—I raise a large quantity of roots on my farm, but I do not feed so many roots as other people. I do not feed the cattle more than half a bushel of roots a day, along with their straw and chaff. To the feeding cattle I give about three-quarters of a bushel a day, along with a little bran and not quite a couple of gallons of pea-meal.

To Mr. Dymond.—The farm on which I am now living I have been living upon for thirteen years. It is in tolerably fair condition. I think it has greatly improved under the system which I follow. I have not adopted the soiling system to any extent. I think the cattle are healthier to be pastured.

To Mr. Whitelaw.—I think it improves the land to keep the cattle in the fields. I have tried all the artificial manures I have heard of, but I don't know that I have ever been benefited by many of them. I have used plaster, and I have lately tried salt. I have not used the salt very long, but I think it is having a beneficial effect. I have also tried guano, bones, and two or three kinds of phosphates. I feed salt liberally to my stock. I have a trough of salt to which both sheep and cattle can obtain access every day.

T. McCRAE.

MR. GEORGE RUDD'S EVIDENCE.

DEVONS.—COTSWOLDS.

GEORGE RUDD was called and examined.

To Mr. Whitelaw.—I reside in the township of Eramosa, but I have a farm also in the township of Puslinch. I have been a breeder of Devons for twenty years. I first bought from importers. The Devons are my hobby. They satisfy me very well. I have found them to be very good feeders, and to mature as early as any other cattle I see. I am a breeder rather than a feeder, although I am just now beginning to feed a little. I have always been able to sell all the cattle I could spare. I have sold a great many herds throughout Canada and the United States, and have generally obtained very good prices.

[*Mr. Rudd.*]

FEDDING.—EARLY MATURITY.—DRAUGHT OXEN.—MILKERS.

As working oxen, I consider the Devons superior to all other breeds, as they are very quiet and tractable. I have had them crossed with the cows of some of my neighbours, with my own cows that I have kept to supply milk for the house, and with Durham cows. We reckon them to be particularly good milkers. There was a little fuss in our society in Puslinch about milking cows, and I laid a stump of \$100 to milk the Devons against any other breed of cattle, and I tried two three-year-old heifers with their first calves, and I made 24 pounds of butter from them in one week. But they were, of course, picked heifers. The Devons are very sharp cattle, and smart on their feet. I have tried other cattle, but I always went back to the Devons, and always liked them better than before. Irrespective of their value to cross with other animals, I think it would pay well to keep them as a distinct breed. During the last three years I have had a great many bulls—more than I wanted; and this spring I sold two two-year-old bulls, weighing 3,350 pounds, for \$5.25 a hundred—delivered the same day for shipment. The same day I saw other good steers sold at \$5 a hundred—to be delivered two months later. So the Devons must be considered better for shipment. With the same quantity of feed they seem to take on flesh better than the Durhams. I had a bull at the Centennial at Philadelphia that weighed between 2,300 and 2,400 pounds; he was nine years old. I have seen the Devons crossed on the common stock of the country, but I have never crossed them myself much. The crosses produced are very good milkers; and I have seen very nice steers, which have brought a good price, bred from my bulls.

TREATMENT OF CALVES.—SALE OF HERDS.

I always allow the calves to suck their mothers. I generally have the calves come about the first of April—sometimes a little sooner and sometimes a little later. In winter we generally feed them chaff and turnips, and sometimes cut feed—a small quantity of hay mixed with straw and a little bran. I do not give breeding cows any meal—not even after they calve. I give them bran and turnips and hay after they calve. I have obtained as much as \$220 for a bull calf. I have sold bull calves largely in the United States; and during the last two or three years I have sold a good many in Canada. During the last two years I have sold four different herds in Canada for the buyers to begin breeding with. The year before last I sold two herds in Toronto and one in Quebec, and this year I sold one in Montreal and one in Durham. A herd usually consists of four females and a bull. I once had a very large herd of cattle, but I have not so many now. At present I have about 34 females and eight bulls.

PRIZE COMPETITORS.

To Mr. Brown.—I keep the North Devons. I have had pretty heavy competition at the exhibitions in Toronto, London and Ottawa. Mr. Peters, Mr. Pinkham, Mr. Witter, Mr. Hamilton, and others have competed against me; I could not name all. At Philadelphia I showed two bulls—the old one, and a young one from the old bull,—and the old bull got the first prize and the young one the second. This competition was against other Devons. We first showed against the Devons of the United States, and got the first prize; then we showed against all Europe and the United States, and got the first prize, and a diploma for Devons against the world. My opinion is that, so far as size is concerned, the Devons mature earlier than any other breed.

GOOD MOTHERS.

They are very good nurses, and do remarkably well with their calves. There was a committee appointed every year in Hamilton by the society to examine the stock to see that they were not too fat, and I was nearly ruled out with one calf, because it sucked its

[*Mr. Rudd.*]



DEVON CATTLE.

mother there. They are uncommonly good mothers, and keep their calves very fat. I have not fed very many steers. I have just begun feeding.

GOOD STEERS.

I have a pair of steers two years old that weigh about 1,400 pounds each. I had a good supply of bulls, and I was persuaded by some of my friends around me to try and raise these two steers. I don't know whether I would get more money for working steers or for beef steers. There is a good demand for working steers in this country. I think that class of cattle are not so well known here as they ought to be. I saw a yoke of oxen that had never been fed sold for \$180 at three years old, and I suppose that would be an average of what they would sell for. The demand with me has of late been more for females. I know two or three persons who have obtained Devon bulls for the purpose of improving the common stock of the country. Last winter a man from Orillia got a Devon bull from me, and he is going to try to improve the Hereford cross with it.

FINE BEEF.

With regard to beef, the Devon is reckoned to produce very nicely mixed beef, and of very fine quality. A few years ago I had a heifer killed in Guelph because she refused to breed, and her beef was claimed to be of very fine quality. I think I can maintain equal weight in Devon steers at three years old with Hereford or Shorthorn steers—that is, on the average. They are very good graziers; I don't know how they would compare in that respect with the Durhams or Herefords, because I have never kept them. There is a register for Devons in Toronto, but no regular herd book yet. We have been trying to get a herd book for some time, and I suppose that in the course of time we shall succeed. With regard to their sureness as breeders, I have never had any trouble except with one heifer ten or twelve years ago. I dare say we over-fed her to make her look well for the show.

DURHAMS DISCARDED FOR DEVONS.

To Mr. Dymond.—I kept Durhams before I kept Devons. One winter I thought I would like to try the Durhams again, and I sold out all my Devons, and bought a lot of Durhams for which I paid a big price; and after I had kept them for six or eight months I got sick of them—I thought I was nowhere—and before the summer was out I sold them all and bought back the Devons. I considered that they were much harder to keep up and look after, and that they did not pay for the extra trouble and expense. The Devons are a hardier cattle, and much more tractable and more easily managed and taken care of than the Durhams; but the temperament of cattle depends very much on the way they are managed. I have sold more Devons of late than I did. The persons who have bought herds of Devons from me are, Mr. Wood, of Islington; Mr. Morgan, of Weston; Captain O'Brien, near Barrie; Mr. Kay, of Durham; Mr. McPherson, of Ohio, and a gentleman from Orillia. I sell my cattle principally in herds, but I have sold several single bulls. A bull from fifteen to eighteen months old I generally sell at from \$150 to \$200; I have got more for them sometimes.

OXEN FOR AGRICULTURAL PURPOSES.

With regard to the demand for oxen for agricultural purposes, I bought oxen myself this year, and I find they are cheaper than horses. If the right kind of oxen can be produced, oxen that will stand the heat and the work, I think the demand for them will increase. We can use them for everything except for marketing grain—they wouldn't do for that. There are a great many oxen used, though I cannot say that there is a tendency to use them on improved farms. I cannot say what they might do if the farmers had a chance to use them; but horses are more used because they are more plenty than oxen.

[*Mr. Rudd.*]

To Mr. Brown.—There is some difference between the North and the South Devons. There is a little difference in the colour. The South Devon is a little lighter red, as well as a lighter breed than the North Devons.

To Mr. Dymond.—I know some persons who are trying the experiment of crossing a Devon bull and a Hereford cow.

OBJECTIONS TO THE DURHAMS.

The greatest objection to the Shorthorns which I found in keeping them was that they lost teats, and went bad in the bags, although we did not allow many of the calves to milk the cows, but milked them chiefly by hand. I had not the same experience with the Devons. The animals which I had at Philadelphia I have shown all over the country and the United States, and they have carried off prizes at almost every place where I showed them. These prizes were for Devons against Devons. I never took the trouble to show them against Durhams except once, when I showed two animals against Durhams and got two first prizes for them. That was in 1866, in this neighbourhood. The prizes were for the best thoroughbred animals—the best bull and the best cow. I carried off the first prize for the best bull, the second for a yearling bull, the second for a two-year old heifer, and the first for a sucking calf. My father owned a stock of Devons in the old country; I have never had any old country experience. The difficulty with the Devons in this country has been that they have been kept in the shade. I made them known in some places. I never imported any; H. H. Spencer imported them, and I bought from him those which he imported. I think the Devons are the purest blooded cattle we have. We can breed them for colour, and can always be sure of the colour, while we may have, for instance, a white Durham cow which will have calves as red as blood. You will hardly ever see a calf which is sired by a Devon bull any other colour than red. I don't know the history of the Devon. Any breed of oxen can be made useful for agricultural purposes if they are trained from an early age; but none of them can be made equal to the Devon, because they have not got the spirit in them. The Devon is a very lively, spirited animal, and is finer in the limb than the Durham.

COTSWOLD SHEEP.

To Mr. Whitelaw.—I generally keep a large flock of Cotswold sheep. I have been a breeder of Cotswolds for a good many years. I have found them well adapted to this country. I have also had Southdowns, but I have only Cotswolds at present. A number of years ago I kept some common sheep, which were then supposed to be Leicesters. I have kept the Cotswolds as a breeder; my market has been in Ohio, Kansas, Iowa, and Salt Lake. It was the demand from the United States that induced me to keep the Cotswolds. The demand from Canadian farmers has not been equal to that from the other side, though I have sold a good many in Canada. I have sold a good many young rams in Canada for breeding purposes.

To Mr. Dymond.—My experience has been that Canadian farmers have been breeding from Cotswolds more than from any other breed, in order to cross them on the native sheep. I could not speak of the suitability of the Galloway as a working steer. Some classes of oxen are very troublesome to break; I think the worst bred animals are, as a general rule, the most difficult to break. I would like the Devon stock to be more inquired into. The Devons have been thumbed down too much by Durham breeders. There are some breeders of Devons in the neighbourhood of London. I omitted in my evidence to mention one yoke of oxen, Devons, for ploughing; we could not beat them either in cold or hot weather with the best span of horses we have.

GEORGE RUDD.

MR. GEORGE HOOD'S EVIDENCE.

HEREFORDS—SHEEP.

GEORGE HOOD, of Guelph, was called and examined.

To Mr. Whitelaw.—I have been a breeder of Hereford cattle for about eleven years. I am not breeding this year.

FOR BEEFING, AHEAD OF OTHER BREEDS.

I consider the Hereford breed, for beef purposes, ahead of all other breeds. I consider that a Hereford bull upon the common stock of the country will produce a better steer for beef than the Durham will. It will come earlier to maturity, and at three years old will be, as a general rule, just as heavy. I have had Hereford grade steers at our shows in Guelph weigh over 2,000 pounds at three years old. A three-year-old Hereford grade, with the same feed and treatment, will weigh more than a Durham grade of the same age. I think the Herefords better adapted to this country in every respect than the Durhams.

HALF A CENT A POUND MORE THAN DURHAM GRADES.

A cross of a Hereford on the common stock, or upon our graded Durhams is the animal that will fetch most in the market; if one comes upon the Guelph market here, it is sure to fetch fully one half cent a pound more than the Durham grade.

BEST PRICES IN ENGLAND.

Buyers coming from the old country market will have a preference for Herefords over the Durhams, because according to the *Mark Lane Express* and other papers every week, as well as my own observation, when I was in London in 1878, the Herefords and Scots brought 8½d. or 9d. a pound, while the Shorthorns or common cattle would not bring more than a penny or a penny-halfpenny a pound less. I think the Hereford will stand the journey across the Atlantic better than the Durham, and with regard to its grazing qualities, wherever you put it, it will fare better and help itself better than the Shorthorn will. I think it is easier kept, and kept in better condition, than the Shorthorn.

AGE AND WEIGHT FOR SHIPPING.

First-class steers should not be shipped for the old country market under three years old. I would rather have them four years old than less than three. The weight depends a good deal on the style of the animal. The general run of the cattle most inquired after is a well-made, well-matured animal that will weigh from 1,300 to 1,500 pounds. But there are exceptions. You will find persons who will take an animal weighing 2,000, but for one that will do that, you will find twenty who want to get them at 1,400 or 1,500 pounds. I think it would be to the advantage of the ordinary farmers of the country to use Hereford bulls instead of Durhams. I think the different breeds should be kept up, because to get this shipping animal you must have certain crosses and keep the two breeds distinct; but I contend that it is a great improvement in raising fat steers to have a cross from the Herefords.

A DISTINCT BREED.

As a distinct breed the Hereford is valuable. I don't know much about Devons; but I think with Mr. Rudd that they are a distinct breed, which is more than can be said

[*Mr. Hood.*]

of the Durhams. Mr. Stone has some descendants of the original stock of Herefords which he imported first in 1860, and I say that if any one in the county of Wellington had stuck so long to the Durhams, without improving them a great deal oftener than Mr. Stone has done, he would have no breed of cattle at all. What I mean to say is, that the different tribes of Mr. Stone's Herefords have retained their original qualities and form, a thing impossible with any family of Shorthorns. Mr. Stone has infused a great deal of new blood into his herd within the last five years.

PREPOTENCY OF THE HEREFORD.

The Hereford will stamp his character indelibly, and it will remain even in the crosses. I know a section of country near Mount Forest where a bull of Mr. Stone's went some twelve or fifteen years ago. He was there only three or four years, and they are raising generation after generation from the descendants of that bull yet; and to-day the white-faced cattle coming from the neighbourhood of Mount Forest are the best cattle in that section of country. I have not fed many full-bred Herefords—only two or three females and one steer.

HEREFORD GRADES.

I had one high grade steer that weighed at three years old between 2,100 and 2,200 pounds; and a full-bred female—a pretty old cow—weighed nearly 1,900; at five years old she would have weighed 2,200. I never had a Hereford that did not come out with the highest honours in the ring. I have shown them along with other breeds, as breeders, but the Durhams generally beat them—prejudice beats them.

UNFAIR COMPETITION.

There is a class set apart for them in the shows, the same as for the Durhams; but what I regret is that our Provincial and County Associations do not allow a herd of Herefords or a herd of Devons to compete in the exhibitions against a herd of Durhams. Why should it not be so? It is so in England, Australia, and the United States; and in the United States of late years in such competitions the Herefords have taken two prizes to one of the Durhams. But as a matter of course there are a great many interested in the Durhams. An animal with four crosses should not be allowed to be entered as a thoroughbred animal, as is the case with the Canadian Shorthorn Herd Book. We have no crosses in the Herefords; they must be purely-bred ages back. This allowing four crosses is exactly what plays out all the herds in the country. A farmer had better pay four or five dollars to have a cow served by a good bull than to attempt to breed from a cross. Our large breeders ought to use the knife more than they do, and weed out a great many bulls which are now sent upon the country. Nothing should be sent out but what is first class.

HEREFORDS AS BREEDERS.

To Mr. Brown.—The Hereford will stamp his character on his descendants better than the Durham, and it would be much safer to breed in-and-in with this breed than with any other, especially the Shorthorns. I think the Herefords are better nurses than the Shorthorns, because any calves that I have had have sucked their mothers, and both the mothers and the calves are generally in good condition at the same time.

HEREFORDS IN THE SLAUGHTER-HOUSE.

There is one difference between the Hereford and the Durham which is a very great one. We have not killed many pure-bred Herefords in this country—they are too valuable; but in slaughtering, you can take out the paunch of a Hereford steer with one hand, while you have

[*Mr. Hood.*]

sometimes to get two men to pull out the paunch of a Durham. The Hereford carries his beef on the most valuable parts. He is superior to the Durham on his back and loins, and is very much superior in the hams and the crops, as well as in the plates and inside the ribs. You will sometimes get a Durham with a heavy rump and a tolerably good back, but if you look down along the ribs, you will find that it is blue and poor. I have slaughtered and handled a good many first-class cattle in the Dominion. Taking a Hereford grade steer and a Durham grade steer at three years old, and fed on the same amount of feed, I think the Hereford would outweigh the Durham, because the Durham requires more feed to keep up its constitution. I have had first cross Herefords, both heifers and steers, and they were as good cattle as I ever saw. I saw two yoke of oxen, cross-bred Herefords, at the Centennial Exhibition bred by Mr. Burleigh, State of Maine, from a bull of Mr. Stone's stock, that weighed over 2,700 pounds each.

FEEDING QUALITIES.

If you put a Hereford and a Durham steer on pasture, the Hereford would be far ahead of the Durham in the fall, as a general rule. It is the exception to get a Durham that would at all feed in pasture beside the Hereford. I have no doubt of that, both from my own experience, and from what I have seen in the cattle that I have bought from others. I have not bought many Hereford steers of that character, because they are not extensively gone into. Where there is one Hereford steer fed, there are ten butchers after it. I was speaking to-day to Mr. Goodfellow, a townsman, who is shipping for the European market. He buys in the States, and he said to me, "you should have seen some half-bred Herefords that we got from the State of Maine; I had some on the last shipment, and you never saw anything like them." I asked him if he liked that kind of cattle, and he said, "I get all I can lay my hands on."

PASTURE-FED HEREFORDS.

To Mr. Dymond.—These cattle are sometimes sent direct from the pasture to the market. In 1878 I was interested in some six or seven shipments, and was the purchaser of all the stock. We rented space on the ship, and we could put as many as we liked upon it. We had ewes, lambs, steers, oxen, cows, and calves. We sent a number of steers from the pasture, but I do not approve of that, although I think the Hereford would do better when sent from the pasture than the Durham. If I had my choice of ten Durham steers and ten Hereford steers for shipment, and if I could buy them in April at an equal price I would take the Herefords to put to pasture, because the Herefords would bring the most on the market in October. I am not engaged in the export trade just now.

To Mr. Whitelaw.—The Herefords would be worth more than the Durhams in the spring, because they are ahead of them, even for stall-feeding.

To Mr. Brown.—The Herefords are largely raised in Hereford and other counties; there are also large numbers raised in Wales, and they have been taken into the midland counties of England and put upon the rich pastures; and what is making our Canadian beef cheap in England to-day is the cattle coming from these midland counties. These white faces can go into the market very early; they are taken direct from the grass and sent to the butcher, and they bring more on the market in England than the Shorthorns.

SYSTEM OF STALL-FEEDING.

To Mr. Dymond.—Our system of stall-feeding in this country is very bad indeed. Some of our farmers will tie up their cattle in October, and will not let them out until they are driven to market. It is a great mistake. These cattle are not fit to ship. I consider that it is absolutely necessary that feeding stock should run out a little every day; they would ship much better. It is this kind of cattle which occasion so much loss in crossing the Atlantic. Whether or not grass-fed cattle should be shipped at all depends very much on the condition of the British market. If a good market can be found

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in England in the fall of the year, it would pay to send over grass-fed cattle; but they should have a little meal also, as it will make them take to the meal on the ship sooner. If that were the case, I think it would pay better to send them in the fall than in the spring.

AMERICAN COMPETITION.

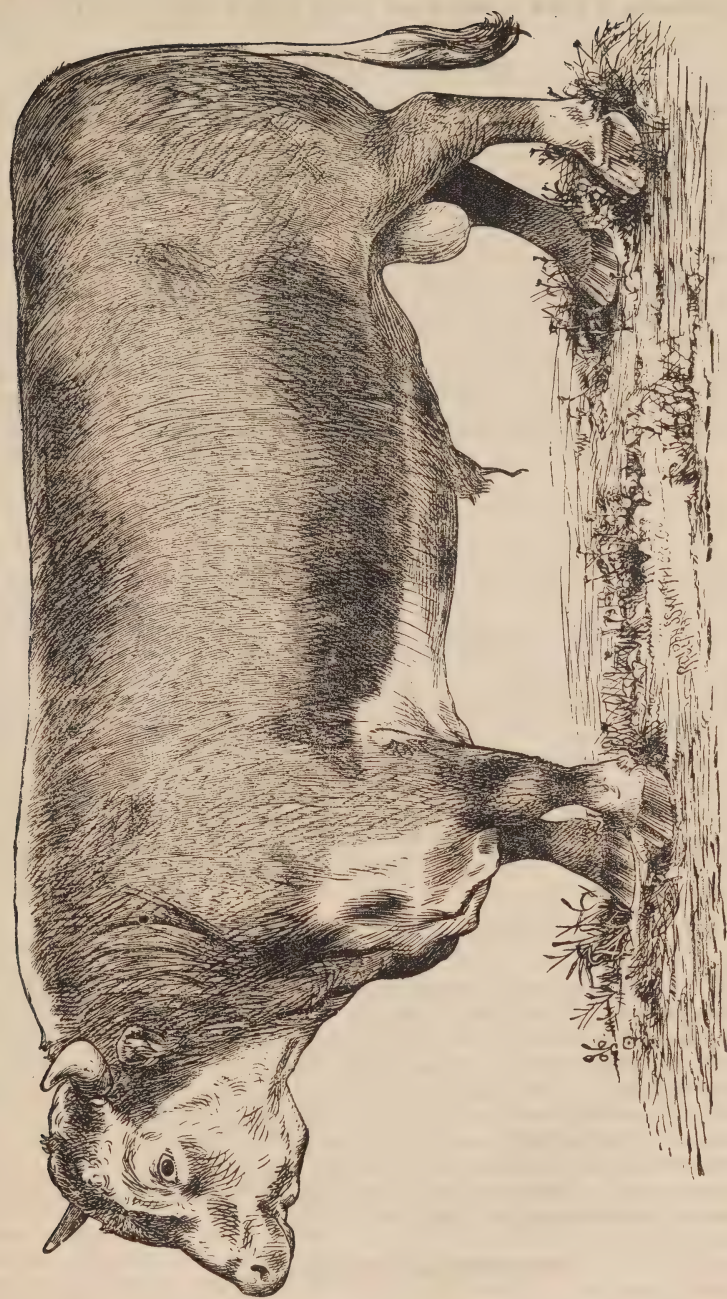
With reference to our ability to compete with the Americans in the cattle trade, I have been to Chicago, and I have bought American cattle to ship to England. At the present time the great surplus of the stock of the Americans which is put on the markets of the world has been fed upon their vast prairies; but as the cattle tread over the plains, the buffalo grass and all the wild grasses upon which they pasture will soon be killed out, and in a short time I believe the Americans will not be able to raise cattle as they are doing now. At present these ranch companies come to Mr. Stone or Mr. Whitelaw and buy ten or twelve Hereford or Durham bulls to put on the range. The cattle they raise from them they take to Kansas city or somewhere else and sell sometimes as many as 500 at a time to the stock feeders, who take them to Illinois, Missouri, or some of the other Western States, and finish them on corn. A large number of these animals are shipped to Europe; but if we try, I think we can compete successfully with them. We are much nearer the market, although one thing that is against our farmers and shippers at present is that we have to pay as much to ship cattle from Guelph to the seaboard as they have to pay to ship from Chicago to the seaboard. Some of these western cattle come from several hundred miles west of Chicago, which tells against them. The travelling of such a long distance as from Chicago to the seaboard is very hard upon cattle. Montreal is a very good port to ship from. I have shipped from Montreal and New York. I have not been shipping since the embargo has been laid upon American cattle. I think, on the whole, that it must help the Canadians.

ROOM FOR IMPROVEMENT.

Our farmers have not paid much attention to breeding. They also sell their cattle too young; they have been sent to England as young as two years old. An animal of that age does not stand the voyage so well as an older animal, and the quality of its beef is not so good. I question whether it would pay a farmer to keep his animals until they are four years old before shipping them. If he had good grazing lands during the summer, and could feed them on roots during the winter, there is no doubt that a four-year-old animal would be a good heavy animal and produce the best beef. I believe it would suit the British market as well as younger cattle; but I would rather have cattle that would weigh from 1,300 to 1,500 than those that would weigh 1,800 or 2,000. They suit the market better, and are more the style of cattle that the butchers want, although the older animal will ship best. An animal four years old is well matured, is stronger in his muscle, and better able to stand the journey than one three years old. I have not had any disease among my cattle. I have had experience in breeding for twenty years. I have been breeding Herefords for eleven years, and I have had a few Shorthorns from time to time. The opinions I have expressed to-day are the result of my own experience of keeping the two breeds, and of my observation of the experience of other breeders. I have had a great deal of experience in the way of watching other breeders. I have been amongst the best breeders and feeders in this and the surrounding counties. I do not think our stock generally is so good as it was fifteen years ago; there cannot be so many good animals brought into the ring now as there could be ten or fifteen years ago. I attribute the deterioration to too much pedigree—too much attention to paper, and not enough to the animal.

THE DURHAMS DETERIORATED.

I think our cattle have run down; our Durham cattle have certainly run down during the last ten years, although there have been importations of new blood to a
[Mr. Hood.]



HEREFORD BULL.

pretty large extent. One cause of the running down was that when the Short-horn fever took hold of the people, everybody went into raising steers; but a good many quit raising steers, and went into raising bulls, and the consequence was that they had to sell at three or four cents a pound or less; I have had them offered to me at two and a half cents a pound. The remedy for this is to breed only from the best bulls; weed the poor bulls out, there are too many poor bulls kept in the country—many that pass under the name of thoroughbreds, and are thoroughbreds so far as their pedigree goes. I do not say that our stock has run down from in-breeding; but a farmer who gets four or six cows and a couple of bull calves will breed from his own, although he has not a bull that is fit to put to a cow, and in that way the standard of the cattle has been run down. I am alluding more particularly to the Durhams. The Herefords have not been run down at all. The Galloways at some of our shows years ago stood ahead of any other cattle there. There may be a few cattle—fresh importations from the United States or England—that carry off the premiums at the shows; but taking our improved stock as a whole, I say that the standard of the Durham cattle of to-day is not so good as it was ten years ago. But within the last three or four years, a large number of our smaller farmers have been ceasing to pay so much attention to pedigree, and are determined to have good animals for the shambles. I think the necessity of shipping the very best cattle to England has had something to do with that reaction. I agree that the animals to be shipped to England should be the very best of their kind. I think the earlier in the spring they are sent the better.

SHEEP-BREEDING AND FEEDING.

To Mr. Whitelaw.—I have been a breeder and a feeder of sheep to some extent. I exhibited largely last year at Chicago and our own Provincial and local shows; and I have killed sheep as a butcher for many years. At one time I used to ship a good many sheep to the New York market every year about Christmas time, and I used to get five or six, or six and a half cents a pound for them. That paid very well; but the demand for heavy sheep, such as I then shipped, has gone. A butcher instead of buying twenty of them now wants only one or two to hang up in his stall as specimens of what can be done with sheep. In New York they now like lambs better than sheep. They will pay \$3 or \$3.50 for good ones in Canada; but it does not pay to sell them for that; the farmers ought to get more for them or keep them and feed them for sheep. I would prefer to ship sheep to the old country market after they have been twice clipped—when they are two years old. They will bring more in the spring than in the fall. In the spring the wool is off them, and they will stand the voyage a little better than when they have got heavy fleeces on them in the fall.

PREFERENCE FOR SOUTH DOWNS.

The Southdown or a cross-bred Southdown will fetch more money on the English market than the Cotswold. There is no doubt that the Southdown makes the finest mutton, although you don't get so heavy a carcass from it as you do from the Cotswold, as they are generally shipped by the head. There would be more profit by crossing with an Oxford or a Leicester or a Shropshire; I like the Oxford. When I was in London wandering through the parks of the west end, I noticed that the sheep grazing in them were invariably half-breeds, crossed with some of the Downs. I asked if they all belonged to one party, and I was told no, that they belonged to the different butchers who supplied the aristocracy in the west end of London, and that they had these sheep on exhibition, so that the people driving through the parks in their carriages could see them; and each butcher prides himself on having his particular brand there, whether it is Oxford or Southdown—but they are nearly always crossed breeds—the Southdown crossed with the Oxford or the Leicester. The sheep were not clipped, as I saw them in the end of May. I am very certain that they would weigh more than twenty pounds to the quarter. A cross of a grade ewe with a Leicester ram, if shipped

[*Mr. Hood.*]

at fifteen months old, and weighing twenty-two and a half pounds to the quarter, would not bring so high a price as a dark-faced sheep; there is a penny or a penny halfpenny difference in the price, if you get a sheep of medium weight and quality. When you take one of these well-fatted long-wooled sheep to the London market, you cannot sell it for mutton, because it is simply a lot of tallow. It might weigh about 130 pounds of mutton, but the mutton is not saleable. The Leicester and the Cotswold sheep are wanted for crossing purposes; I myself would rather take the Leicester, because I consider it has a better constitution than the Cotswold.

EXHIBITION AT CHICAGO.

At the exhibition at Chicago last year, I exhibited pure-bred Southdowns, grade Oxford Downs, grade Cotswolds, grade Leicesters, pure-bred Cotswolds, and Lincolns. Some of the Southdowns were fed at the Ontario School of Agriculture, and a few of them were bred at Springfield by James Anderson. My object in going to Chicago with these sheep was to see what different breeds of sheep they had there, and to beat them if I could. My success was too great; they did not give me what I deserved; if they had, I should have swept the whole place out. As it was, I took a large number of prizes, because my display was far superior to anything else there. Abner Strawn of Ottawa, Illinois, had the royal pen of ewes, and he brought a whole carload of 30, and in that carload was the pen of ewes that took the first prize at the Royal Society show in England, and the one that took the second prize was there also. He had the rams there also. I did not beat him in the carload, and I think he took the first prize for shearing Cotswold ewes.

SHEEP FOR ENGLAND WANTED.

To Mr. Dymond.—We have comparatively few sheep suitable for the English market, and shippers have been buying indiscriminately as to quality; but if a man had one hundred half-bred sheep, especially wethers, cross-bred from the Downs on the long wools—I do not care which of the Downs, although I prefer the Oxford—no doubt he would get a cent a pound more for them from the shippers than for anything else. The sheep at present sold to the shippers are a mixed lot—ewes, wethers, and rams together. I think it would be an advantage for the farmers to try and improve the supply of wethers. Many of our farmers are careless of their wethers, and in the fall they have to take what they can get for them. If they would sell their ewes for the New York market separately, and keep their wethers until they have been two or three times clipped, they would make money. If the ewes were kept separate, and the wethers separate, there would no doubt be a better market for both.

To Mr. Brown.—I think the pure-bred Cotswolds would produce the heaviest carcass at two years old. The second heaviest would be the Lincolns. The heaviest cross at the same age would be, I think, a cross of a Leicester and a Cotswold—I do not think it matters much how they are crossed, but I think it has generally been a Cotswold ram on a Leicester ewe. As for the best fleece at that age, there was a time when long wool was in great demand, but now, since we have the National Policy, manufacturers demand medium wool more.

SOUTHDOWN OR OXFORD DOWN WOOL.

To Mr. Dymond.—At present a great many farmers are crossing the Southdown on the common sheep, because they cannot get anything else. I think the wool that they would get by crossing the Southdown or the Oxford Down on the common stock would meet the demand. Last year while I was at Ottawa some woollen manufacturers who were there as a deputation were examining the different kinds of sheep in the show; and they came upon some Oxford sheep which I had there, and they wanted to know what kind of sheep they were. One man pointed out one of them, and he said, "There is a

[*Mr. Hood.*]

good wool, and a lot of it, and that is what we want." That sheep was got by crossing the Oxford Down upon the common sheep.

To Mr. Brown.—For mutton and wool together the ram which I would recommend for crossing on the common Canadian ewes would be an Oxford Down. I don't think they would make the mutton too large or coarse; I dressed one of them, and the mutton was beautiful. Sheep that will have a live weight of from 140 to 200 pounds are the best for the English market. A sheep weighing 200 pounds would produce more than 100 pounds of mutton.

To Mr. Whitelaw.—I don't think the Cheviot sheep would do for this country. The climate and feed on which it lives in the old country is altogether different from what it would have here. We have no mountain heath and heather in this country.

TREATMENT OF LAMBS.

To Mr. Brown.—I would like to have lambs come in March if there is a place to keep them in. After taking them off the grass in October I would put them on turnips and grain—peas and oats if I could get them. I would also probably give them a little bran, as well as hay and pea straw. To the lambing ewes I would give a little mash. I prefer letting the lambs run with the ewes; if you do not separate them it will not be many days before the lamb will begin to nibble with the ewe. I think it would pay to feed the sheep during the first year of their growth on grain, or to soil them in the field. I am feeding partly on green peas and oats; the sheep are fond of that, and you can feed them almost as cheaply upon it as upon pasture. They prefer it to clover. I keep water accessible to them all the time, and give them any amount of salt. I would wean the lambs in August at the latest, and during the ensuing winter I would give them a good quantity of roots at first, and not too much grain.

CANADIAN BEEF IN ENGLAND.

I maintain that the Canadian beef we are now sending to England is the best beef in the world to-day, unless it is the British beef which the butcher just takes out of the field and kills. There is no part of the world where the cattle have better food than they have in Canada—principally peas, oats, turnips and hay. The cattle raised in the Western States reach their maturity at four years old, and they get their insides burnt out by the Indian corn which is fed to them; it is too heating. I think three years old is the right age at which to ship our beef cattle, because their meat is better marbled at that age than at an earlier age. They do not develop their lean meat very much before then. The tendency of the age is to slaughter both cattle and sheep at too young an age. There is a little greater inducement to keep sheep, because the wool is a consideration, and a sheep's fleece every year will pretty nearly pay for its feed. By keeping the animals, too, you have so much more manure. I believe the Leicester sheep has a great deal of prepotency; you can distinguish its traits after many years of breeding and crossing with other breeds, especially the head of the Leicester. The old-fashioned Leicester is the foundation of some of the best flocks we have got in the country at present. I question if the Leicester would produce a greater quantity of mutton at a year old than a cross of the Oxford or Shropshire Down.

GEORGE HOOD.

[Mr. Hood.]

MR. JAMES HUNTER'S EVIDENCE.

SHORTHORNS.

JAMES HUNTER, of the firm of J. & R. Hunter, of Alma, County of Wellington, was called and examined.

To Mr. Whitelaw.—We have a farm of 340 acres, of which 260 or 270 acres are under cultivation. We are pretty large breeders of Shorthorns; at present we have about sixty-seven head of pure Shorthorns. In commencing to raise Shorthorns, we bought two cows in Canada, but afterwards imported from the old country several bulls and two or three cows.

BOOTH FAMILY BEST BEEFERS.

I prefer the Booth family to the Bates. My principal reason for this is that when I went first to the old country, I knew nothing about either of the families, and I went to see some noted animals on both sides, and I saw at a glance that in the Booth animals we had the advantage in fleshing quality, and I thought that was what we wanted in Canada. So I selected them on account of their feeding qualities. I have bred principally from the Booth; I have not crossed with the Bates since I commenced to import. In purchasing, I looked to the animal as well as to the pedigree. We have not paid such fancy prices as some persons, but I certainly think a few hundred dollars are not lost if they are paid for an extra pedigree. You must have a good animal as well as a pedigree, and I think you should look considerably to the immediate ancestors of the animal itself.

DURHAMS AHEAD OF ALL OTHER CATTLE.

For all practical purposes, I consider the Durham ahead of all other pure-bred cattle. I consider them best adapted for improving the common stock of the country. We have found a ready sale for all the bull calves we could raise; we have never had to fatten a bull for the want of a market since we commenced.

IMPROVED DEMAND.

There is decidedly an improvement in the market this year, both as regards intelligence in the purchasers, and the prices they are willing to pay; the Canadian farmer seems more disposed to pay attention to good bulls than formerly. The average price we have obtained this year for them has been \$168, as against \$143 last year. I attribute this improvement altogether to the demand for the old country market. I have been a successful competitor at the exhibitions. I have had to feed extra for that purpose.

FEEDING FOR SHOW PURPOSES.

I cannot endorse some of the statements which have been made with reference to feeding animals for show purposes deteriorating their breeding quality. I do not think it injures a female for breeding so long as she is kept breeding, although I think the calf may be weaker. Some difficulty may be experienced if time is lost in getting a female to breed again; but we have never had any difficulty in getting our show cattle to breed.

TREATMENT OF CALVES.

Their calves require more care for the first two months than the calves from other cows, but after that two months they are equal to any other calves. We allow our calves to suck their mothers. I do not care to have them come sooner than October, if possible, and from that time till April. I think it is more profitable to have them come sometime before January. I generally sell the bull calves at from eight to fifteen months old; sometimes they are two years old before we get them

[*Mr. Hunter.*]



PURE SHORTHORN BULL.

WANT TO LIVE STOCK JOURNAL?

sold. The calves that come in October we allow to go with the cow for from six to eight months. Towards the spring, when the cow goes on the grass, we take the calf from it, and feed it on cut hay mixed with bran. We keep all the young cattle housed, and feed them on green feed while we can get it, and afterwards on cut hay mixed with bran, and perhaps some boiled feed. We feed the bull and the heifer calves in pretty much the same way. The calves that come in the spring we prefer to let run with the cows during the summer until the very hot weather comes. In the first winter we give the thoroughbred calves all they will eat, and we generally mix their grain with bran and cut hay—or wheat chaff, which we prefer even to the cut hay—their stomachs seem to keep in healthier condition upon it than upon the cut hay. In raising calves, I think it is very important that they should be well attended to during the first two months. During the first six weeks or two months they should be entirely kept away from feed until their stomachs will digest it and they have a cud to chew. The only grade cattle I keep are a few milch cows for the house, and occasionally we have some young heifers that we require for nurses. We do not do any feeding at present; we did before we kept Shorthorns.

ROOT CROPS—CORN—TURNIPS.

We grow an average of eighteen acres of roots a year. Roots are decidedly necessary for the raising of young stock; we have an advantage over American stock raisers in being able to feed roots to young stock until they are about eighteen months old. American corn is too strong a feed for the calves until they come to about that age. Our cows that are not giving milk we feed on straw and turnips—a bushel of turnips each day. We do not give them any grain unless they are coming near calving time or giving milk; of course we also feed them hay before calving time.

PREFERENCE FOR DURHAMS.

I have not had experience in raising any other breeds of cattle besides Shorthorns. It is just from observation that I have got a preference for Shorthorns. Other breeds have been tried for a time and have then been given up. I do not think that is owing to want of appreciation. There was an idea that got abroad in Aberdeenshire that the Hereford was equal to the Durham for crossing on their cattle, and one-half of the people there got Hereford bulls, but they never got them the second time. Aberdeenshire is regarded as one of the strongest beef-producing shires in Scotland.

NECESSITY FOR MORE IMPORTATIONS.

To Mr. Brown.—I think Canada is not able to produce all her own bulls without importing from any other country. This is not owing to want of numbers, but we have to hand-feed our cattle principally, and we have a very short season of natural grass, and I consider that a thoroughly improved animal requires to be kept in a high condition from the time it is calved until it is full grown, and kept so from generation to generation, because by that means we get a natural tendency to fatten; and by bringing breeding stock occasionally from those localities where there are rich natural grasses we get a beast of richer quality, better haired, and a kindlier feeder. I think the price of a pure Shorthorn bull is regulated entirely by the price of beef; according as the farmer can make out of his beef, he can afford to pay for a bull. I do not think it would pay to sell bull calves for \$150 that come from a bull that costs \$10,000; that is going outside of the regular market price. I think it would not be lost money to give \$10,000 for a bull if he is sufficiently good.

To Mr. Whitelaw.—Occasionally a breeder can afford to sell bull calves for \$150 that come from a sire costing \$10,000. There is nothing to hinder a man with a fair sized herd from making a profit by buying a bull for \$1,000.

[*Mr. Hunter.*]

VALUE OF A THOROUGHbred BULL.

To Mr. Brown.—It would pay a farmer with no more than six or eight cows to buy a good bull. If, for instance, a man with 150 acres, who followed mixed husbandry, bought a yearling bull for \$150, it would be some time before he would make his money simply from the service of the cows; but at the same time he must consider that he will realize the greater portion of the money he paid for the bull by fattening it and selling it afterwards on the market as a beef animal—say for \$100. Say that the bull served ten cows—that would be equal to \$30; and his service for one year would be equal to his keep. I consider that in the first season he would improve the native stock one-third. I think that the present quarantine between Great Britain and this country, and the United States and this country, is based on an exaggerated idea. I don't think it is necessary to quarantine the cattle for so long a time as three months; it is debarring those who are desirous of improving their stock from the privilege of doing so. It is not to be supposed that parties who wish to select stock in the old country for the improvement of their herds would buy from any herd that was suspected to be diseased, and after they have crossed the Atlantic, I think a much shorter time would be quite sufficient to ensure their safety from disease.

To Mr. Dymond.—I have never heard of pleuro-pneumonia developing itself in an animal two months after it was brought from the infected herd. I do not know anything about the disease except what I have read. The idea of purchasing a bull worth \$10,000, is that it may sire an animal worth nearly as much as itself. When a farmer invests in a bull, it is with the view of permanently improving his herd in the first place, and in the next place of getting an incidental return by selling the bull for beef. The highest price I have ever given for an animal in the old country was 305 guineas; it was for a pure Booth yearling heifer of the Mantilini family. I believe that was a profitable speculation. I do not find a very large market among Canadian farmers for that class of stock as yet. The bull calves I have been raising recently I have found a market for among Canadians. I account for the Bow Park people being obliged to send their bulls to the United States by the fact that they are decidedly strong on the Bates cattle, and there was originally a lot of those cattle imported to the United States from England. These having got into the hands of a number of wealthy men, they are naturally more interested in these cattle and more anxious to uphold their character. The bulls sold by Mr. Clay for \$311 in Chicago would probably be about the same age as those I have been selling for \$150. The Bow Park herd is certainly in pretty good condition at the present time, and the animals would be regarded as fashionable as well as useful. If we expect to supply the Canadian market with the animals required, we have to look to utility rather than to fashion. Canadian buyers do not pay the same regard to colour and fashionable points as American buyers, who are, I think, prejudiced in favour of red to a fault. We cannot raise improved cattle in this country so well as they can in England. We have not got a good grazing season in this part of the country. I think the condition of cattle depends a good deal upon the atmosphere in which they live. In England there are not such great heats in the summer as there are in this country, and the cattle develop better from the native grass there than they do in this country. I don't think I would approve of shipping pasture fed cattle to England for beef; I am doubtful that they would stand the voyage so well as grain fed cattle, although I am not sure that the butchers prefer grain fed cattle to pasture fed. We prefer clean wheat chaff to all descriptions of cut hay; if the cattle are fed upon it, they seem to do better than on their regular food. Cut clover hay is decidedly better than timothy, which I think is too hard and wiry to cut up for feed for young cattle.

COLOUR PREJUDICE.

To Mr. Brown.—I think it is altogether a prejudice that makes people favour colour in Shorthorns. We fed considerably before we began breeding Shorthorns, and our ex-

[*Mr. Hunter.*]

perience as feeders led us to favour pure white ; we have had more first-class feeders among pure white cattle than we have had among red cattle. This year I have found quite a change in Canadian buyers ; we had more inquiries for roan bulls than we had for reds. The Shorthorn is very uncertain in its colour ; it is not uniform. It is a made up beast. I do not think it is a pure-bred beast at the best.

CANADIAN HERD BOOK.

To Mr. Whitelaw.—We enter almost entirely in the Canadian Herd Book. In its way it is perhaps good enough, but I think there are plans that might be adopted that would make it more convenient for the general farmer. I think it would be well to have each man's stock all entered in the book in one place. That plan is carried out in some of the volumes of the English Herd Book. In that way you could at once see all the stock that a man has got, and it would entail very little additional work. I am certainly in favour of raising the standard of the Shorthorn for registration ; it should be at least as high as the American standard, which is seven crosses. Americans have an objection to the Canadian Herd Book, which I believe is owing to the fact that it admits grade cattle.

To Mr. Dymond.—The Herd Book in that way gives the grade an advantage over a certain class of thoroughbreds—that is, the animals whose pedigrees are starred. The Canadian Herd Book admits the fourth cross from a Buffalo cow, and it puts this animal over an animal with a clear pedigree, only that there is some fault or objection to a certain animal, and it is marked with a star all through the Herd Book. The animal with four crosses stands in the Herd Book as a thoroughbred animal. I would not have so much objection to admitting a grade beast, if this were not done, and if it appeared in the book simply as a grade ; but there is no clue in the book to a grade animal, and those who are not acquainted with the Herd Book may buy one of these and when he finds out his mistake will be very much disappointed. I would not be in favour of entering other breeds besides the Shorthorns in the Canadian Shorthorn Herd Book ; but if there is to be any change in the Herd Book, I think it would raise the standard of it very much to distinguish between what is bred from a common Canadian grade cow, and what is bred from cattle descended from imported stock. The Herd Book gives the pedigree of each animal, but it does not show whether it is descended from a good animal or a poor one. It would be an advantage also if a little more punctuality were observed in issuing the different volumes of the Herd Book.

CLYDESDALE HORSES.

To Mr. Whitelaw.—I am raising horses for the market to a limited extent. I have been looking for Clydesdales in selecting the stallions. I consider the Clydesdale the best horse to cross upon our common Canadian stock for general farm purposes. I would not use them for any other purpose but farm purposes, but you sometimes get a very good general purpose horse from a cross of a Clydesdale and a Canadian mare. I do not think there is any heavy horse that equals the Clydesdale to cross on one of our light Canadian mares in order to run the chance of getting a good general purpose horse, either as a driver or for general work. It will occasionally be on the heavy side for a roadster, but not always.

JAMES HUNTER.

[*Mr. Hunter.*]

MR. JOHN S. ARMSTRONG'S EVIDENCE.

SHORTHORNS.

JOHN S. ARMSTRONG, of Eramosa, County of Wellington, was called and examined.

IMPORTATION OF SHORTHORNS.

To Mr. Whitelaw.—My farm is in the Township of Eramosa, and is composed of over 300 acres. I am a breeder of Shorthorns and a considerable feeder of grade cattle; I also follow mixed husbandry. I have imported a number of Shorthorns lately from the Old Country, from three or four different parties—W. S. Marr, Cruickshank, and James White. They are all Aberdeenshire men.

THE ANIMAL WANTED.

I had studied and read a good deal in order to get information as to what kind of cattle would do best in America, and when I went among the breeders I found that their idea was to get a beast that was small-boned, low-set, and that would take on flesh fast. After I bought them they were exhibited at the Highland Society's Show and took prizes. I have imported four different times, the first time eight or nine years ago. When I am buying an animal I look for individual merit as well as a pedigree; a pedigree is of no use if there is not a good animal along with it. I have found the Shorthorns to answer the purpose for which I imported them.

GRADE DURHAMS—ADVICE TO FARMERS.

When my father first came into the country—it was before a stick was cut in this locality—he brought in some animals that were Durham grades from American stock, and I think that gave us a chance to be more successful than a great many. I have also bought natives, and put them along with my Durhams. I have not imported other full-bred animals. I think the Durhams are the most profitable animals we can import into this country. You may take a Durham and cross it with another animal, and you will get an improvement on that animal, but you cannot get any improvement on the Durham. I think them the best breed to cross on the common stock of the country. I think the most profitable course for ordinary formers to pursue is to keep the best pure male that they can get and breed it with the next best grade they have got.

SENDING TO SHOWS DETRIMENTAL.

I have fed some cattle for the shows, and have injured some in doing so. I have found that it was detrimental to their breeding qualities; but if a man does not exhibit, people will say "This man does not show, and therefore there is something wrong with his cattle." As they told me in Great Britain, "If you don't show, you may as well quit raising cattle." And we have to sacrifice some of our best stock in order to advertise the rest. I am now trying to advertise them in another way—feeding them for the market, and in that way I hope to show just what they will do.

FEEDING FOR MARKET.

I have been a pretty successful feeder of cattle. I have raised some of the best well-bred cattle in the Province. As soon as any fresh blood comes in we try to get it to our stock. In fattening cattle for the market, I feed them from the beginning, and sell them when they are two or three years old. The three-year-old steers would weigh about 2,000 or over; the two-year-old steers weigh 1,300 or 1,400. Several of them went to Ottawa,

[*Mr. Armstrong.*]



SHORTHORN COW.



and were sold to the butchers for Christmas and Easter meat. One heifer I sold for \$140, and another I sold on its feet, at London, for 15c. a pound; they all realized from 10 to 12c. a pound; I think all I fed for Christmas beef would average 12c. I consider that these cattle have paid me amply. I have never made a calculation as to what it costs to keep an animal for a month, but I always felt satisfied that they paid me well—better than any cattle I raised. One animal that went to Ottawa I sold for between \$400 and \$500. Their principal feed is peas and oats, with a little flaxseed, and of course turnips and mangolds. I would give about a bushel of turnips a day to a two or a three-year-old animal. I prefer feeding the cattle often to feeding them in large quantities. I let them out once a week for exercise, except the extra beasts, which I let out every day.

COMPARISON WITH NATIVE CATTLE.

The only animals, besides the Durhams, which I have tried to feed, are the natives. A Durham grade steer at two years old, if he was properly fed, would bring over \$80, while a native steer, at the same age and on the same amount of feed, would bring perhaps \$40 or \$50. It costs as much to raise one as the other. Last fall I bought six natives, and put them with my Durham steers, one year old off, on the same feed—clover and chopped feed—and I kept them in the stable all winter, and this spring my young Durham grades came out stronger and bigger than the three-year-old natives. I think there is very little profit realized on the native cattle, even if they are bought at a low price. I bought some Durhams afterwards that I paid a big price for, and I realized more money from them in about half the time than from the natives. Some of my cattle were shipped to the old country in Mr. Craig's shipment. Some large ones brought me \$140, and the common cattle that were fed all they could eat for over seven months did not realize more than about \$70 apiece; that is about one half. I have no doubt that if any person would compare a number of Durhams with natives, he would find that the profit on the Durhams is more than double the profit on the natives.

PEDIGREE ALONE NOT SUFFICIENT.

To Mr. Brown.—I would not despise pedigree in a Shorthorn; I would wish to get an animal whose pedigree could be traced back to the very best animals: but I would not take an inferior animal simply because he had a pedigree. My idea is to clean all the weeds out, and breed with the very best stock we can get. My object all through has been to get the best animal I could to breed with. My stock is mixed; I have both Booths and Bates. I have paid particular attention to get an animal with a fine bone and heavy flesh. I would advise the ordinary farmer, with a dozen or so of average native cows, to use the best bull he can get. I would not go only to a high priced pedigree animal, but I would get an animal that I could trace back to good stuff. That is the practice I followed before I bred Durhams—I got the best bull I could find.

THE NEARER TO PURE BLOOD THE BETTER.

There is not much difference in the crosses of the Durhams; but I would rather take the second or third cross on a pure-bred male and breed up on the female. The nearer you come to the pure blood the finer bone you will get. I have noticed that our Canadian Durhams and natives get a heavier bone if they are kept for a long time in the country.

IN-AND-IN BREEDING.

I do not approve of in-and-in breeding, although I have heard it advocated by a good many. I have tried it, and I have found that it weakens the constitution. You will sometimes get a first class animal by in-and-in breeding, but you will mostly get very inferior animals.

[*Mr. Armstrong.*]

HEIFERS AND STEERS AS FEEDERS.

I have fed both heifers and steers. A heifer will feed the easiest, but a steer takes the market better, so that on the whole I prefer steers. In buying a steer in October or November for \$40 my idea has been to double my money in March. That is the principle I have generally acted upon, and I have generally realized my expectation.

MANAGEMENT OF CALVES.

When a calf comes in the end of the year—in October or November—I let it suck all winter. I have stalls, where the mother stands at one side and I tie the calf at the other. I begin to feed a little chopped stuff and hay and turnips to the calf while it is sucking, and I keep on feeding it in that way until the grass comes, and I then put it out to pasture and do not bring it in again until the fall. I allow it to suck the mother for nearly nine months—until it is going to have another calf. When we keep the mother and the calf together they seem to be quieter than when we keep them separate.

PASTURE AND STALL FEEDING.

Our common cattle we leave out in the pasture all summer. I have some steers that I put out to pasture this spring and they are laying on flesh fast. A good deal depends on how they are fed before they are sent out. When they are in the stalls during March and April I would not crowd them too much, but try and keep them in good growing condition. I top off the steers for market principally with grain. For the last five or six years I have sold them when they were two years old, and their average weight has been from thirteen to fourteen hundred. I think I can make more profit by selling them at that age than by keeping them until they are three years old, as I realize my money sooner and save a year's interest. You won't make enough on the third year to pay you for keeping them. The shippers have been very glad to take what I have had to give them at that age. If a calf comes in October, I can easily run it up at two years of age to 1400 pounds. I am now speaking of well-bred grades.

COARSE GRAINS TO BE FED, NOT SOLD.

To Mr. Whitelaw.—I raise all the coarse grain I use. Of course I have a mill, and I get the chops from the mill a good deal, but my idea is that a farmer should not sell any coarse grains that he raises, but feed them all to his stock. By doing that, he will not only fatten his stock, but keep up the fertility of his farm. I have been in the habit of buying Indian corn for feeding purposes. I have not bought any lately, partly because we had a very heavy crop of peas last year, and partly because I would not like to give seven cents a bushel extra for western corn.

CORN *versus* PEAS.

To Mr. Brown.—The price at which corn should be per bushel to pay as a cattle feed depends on a good many things. If the peas sell at seventy cents, you may be able to sell your peas and buy corn profitably; or if the market was high for beef, you could of course afford to give more for your corn; but if the market was low, it would not pay to feed corn.

THREE MONTHS' QUARANTINE.

With regard to the importation of fresh cattle, Canada is in a worse fix than any other country, as we cannot import any cattle from the States or from Great Britain without leaving them for three months in quarantine. I think the Government are perfectly right in trying to keep out disease, but I think that there are large stock farms in England from which cattle could be got free of disease, and there should be men to inspect them and see

[*Mr. Armstrong.*]

that there is no disease in their flocks. I would like to see some means adopted which would allow us to import fresh blood ; if we do not do so, our herds will deteriorate, or else we shall have to go into in-and-in breeding.

To Mr. Dymond.—This quarantine is concurrent with the embargo on American cattle in England, and that has helped the Canadian shippers to some extent ; but the quarantine must in the long run injure our stock.

NECESSARY TO IMPORT NEW BLOOD.

It is necessary to go to England to get the kind of stock which is sometimes required in this country. We have large breeders in Canada, from whose herds we might replenish our stock ; but if we have stock which we have imported from the old country, we can sell at a higher figure than if we take Canadian imported cattle. We have in Canada at the present time large breeders who have perhaps as fine animals as can be purchased in England ; but if they know that we cannot go to England to buy, they will put a high price on their stock. The market in Canada is too contracted for us to depend upon exclusively ; there is one family that we have not many representatives of in Canada—that is, the Booths. The Americans have very few, if any, Booths. We cannot even bring in American cattle in consequence of the three months' quarantine. If you are raising stock simply for exportation as beef, you can get a very good bull for that purpose in Canada ; but a person who is breeding pure stock must be careful in the selection of his male animal. I think we should have the largest chance for selection.

GOOD STEERS FROM FIRST CROSSES.

The cattle which I spoke of as weighing twenty hundred pounds were pretty nearly thoroughbred, and that is why I say that the nearer you get to a thoroughbred in breeding your crosses the better. Sometimes you will get an animal in the first cross just as good as you will in the third or fourth cross ; but in having more crosses you get your animal well stamped, while if you have only one cross you may get a first class animal, but you may get a very inferior one—no better than a native. Under ordinary circumstances, the weight of a steer at three years old, bred from a pure-bred bull on a native cow, would be sixteen hundred pounds. I think you should get a great many good steers for shipment at that age from the first cross.

SHIPPING ON CARS.

I have shipped a good many on the cars, and I have been told that they got on very well. Parties have told me that mine, which were stall-fed, were worth \$1 a hundred more than others which were pasture-fed. I have never had any complaints of failure on the trains or on the ships. If they are very heavy they require a great deal of care. The cattle taken over this year by Mr. Craig were nearly thoroughbred. For those he bought from me—I did not feed them long—he gave me \$6 and \$6.50 a hundred. In the spring of the year I have generally got about \$5.25 a hundred for the grades. But these high prices, which I received and mentioned before, were fancy prices for three year old steers extra fed, and could not be taken as a guide to the farmer in his ordinary business. I have heard shippers complain a good deal of people putting cattle on the cars and not feeding them on grain ; they say they do not stand the voyage well.

MARBLED BEEF.

With regard to marbled beef, that depends a great deal on the feeder as well as the breeder of the animal. If a young beast, for instance, losses what is called its calf's flesh and once gets down, it will never be the same animal again. My idea of feeding is to keep on feeding from the beginning, and always improving ; in that way you will get a better quality of flesh in every respect, and instead of fat being all on the outside you will get the fat and lean mixed or marbled. I think it is more profitable to ship nearly

[*Mr. Armstrong.*]

thoroughbred cattle at two years than first crosses on native cows at three years; I think it would pay the average farmer best.

AN UNLIMITED DEMAND.

About May or June is the time when they take best on the old country market I can sell all I raise, and that is the experience of all the breeders and feeders in my neighbourhood. If they have good stock, they have no difficulty in selling it; but shippers will not buy inferior animals for shipment to Europe, so that men who persist in raising inferior animals are getting a worse and worse market every year.

THE POLLED ANGUS BREED.

I have not paid much attention to the polled Angus. But when I was in Britain I saw some of them, and they were the finest animals, except the Durhams, that I have seen. For flesh some of them are superior to the Durham, but not for profit. They do not seem to me to be on the whole equal to the Durham; if you cross the two, you will find that the cross between the Durham and the polled Angus will be a better animal than the polled. The male generally stamps his character on his offspring more than the female, so that if you put a polled Angus bull on a Durham cow, he has a chance of impressing his character. Some of the best cattle exhibited in the Smithfield market in London—fat steers—have been crosses between the polled Angus and the Durham; but I doubt that we could improve our stock in Canada by breeding with a polled Angus bull, although I have not tried it. The crosses of the polled Angus and the Durham which I saw in the old country were not black, but mostly always roans. I cannot tell whether the bull was a polled Angus or a Durham. The polled Angus and the Galloway are perfectly distinct breeds; I would prefer the polled Angus to the Galloway. Black cattle are popular among the butchers in England, and they bring the highest price on the London market. Their flesh is supposed to be finer than that of other cattle. I don't know that we would get more profit by shipping them than we do by shipping the Durhams.

To Mr. Brown.—I don't think we are in a position in Canada to go on for the next fifty years without importing any fresh blood. I think it is absolutely necessary that we should go to another country for fresh blood time and again.

THE CANADIAN HERD BOOK.

To Mr. Dymond.—I register in the Canadian Herd Book. I am not satisfied with the principle on which it is conducted. I think we should have a new edition of it before this time, and I think there should be another cross or two added to the animals registered in it; I would not admit a male with only four crosses at all. The managers of the book are raising the price of entering; we used to pay half a dollar for entering, now we have to pay 75c.

AMERICAN COMPETITION.

To Mr. Whitelaw.—If we breed the right kind of cattle in Canada, I think we can compete with the Americans in the English market. I think we have a climate and feed in Canada to enable us to successfully compete in raising cattle with any other country.

To Mr. Brown.—I refer specially to quality, although we can have numbers too, if the farmers go properly into stock raising.

To Mr. Dymond.—I never tried to import American stock for feeding purposes. There is a complaint about American cattle not being so good as Canadian, because the American cattle roam at large all the time, and their beef becomes tougher than the beef of cattle which are fed in the stable. The Americans let their cattle run till they are three years old, then they put them up and feed them for a little while on nothing but corn, so that the fat all runs on the outside in lumps, whereas Canadian cattle begin to feed from their infancy, and keep their flesh regular all their life.

JOHN S. ARMSTRONG.

[*Mr. Armstrong.*]



SOUTHDOWNS.



MR. ANDERSON'S EVIDENCE.

SOUTHDOWNS.

JAMES ANDERSON, of Puslinch, was called and examined.

SOUTHDOWNS THE MOST PROFITABLE.

To Mr. Whitelaw.—I am a breeder of Southdown sheep exclusively at the present time. I have had both Leicesters and Cotswolds in the past. I have bred Southdowns for about twenty years—ever since I commenced breeding; I tried a few Leicesters and eight or ten Cotswolds for three or four years, but I found the Southdown paid me a great deal better. They are hardier than either the Cotswolds or the Leicesters. You can keep three Southdowns or more for every two Cotswolds. I found that the Cotswolds required a great amount of feeding to keep them in the same condition as the Southdowns. The Leicesters, I thought, were too small—I only had them for two or three years. I gave both them and the Cotswolds up because I could make more money out of the Southdowns.

MARKET FOR RAMS.

Previous to the last two or three years my principal market has been in the United States; but now I can sell all the rams I can breed for crossing with long-woolled sheep. I will give you an instance which occurred in my own neighbourhood. Mr. Christopher Quarrie bred the Southdowns with Leicester grades, and now he can get five cents a pound more for his wool, and he can produce from the cross a fleece of seven pounds against four and a half pounds from the pure Southdown. That was the advantage of the cross.

CROSSES WITH LEICESTERS.

I think the cross of a Southdown ram on a grade Leicester ewe would be better than a cross with Oxford Down rams. The first cross is always the best. The cross of a Southdown ram on a grade Leicester or Cotswold ewe would weigh, at two years old, 80 to 100 pounds; and if you fed them with grain from the time they were lambed they would go up to 150 or 160 pounds. It is only very recently since the better class of wool has got into greater demand. The butchers decidedly prefer Southdown mutton to any other, and they want the first cross if they can get it; I don't know whether they charge their customers any more for that class of mutton, but I don't think they do. I have exhibited a good many sheep, and several times I have taken the first prize at the Provincial shows for lambs.

SOUTHDOWNS EASILY KEPT IN WINTER.

I think the Southdowns are easily kept during the winter; they are much easier fed than the Cotswolds, but the Leicesters I could not be so positive about. I prefer to have my lambs come pretty early, the last of March or sometime before they go out on the grass. I have found a good sale for ram lambs recently, and I generally sell them as ram lambs. In former years I used to sell my ewes entirely to people from the States. I have sold shearling ewes at a very good price. I account for the recently increased demand in Canada by the opening up of the English market. Medium wool has lately been increasing in value.

HARDIER THAN OTHER BREEDS.

To Mr. Brown.—I think the Southdowns are hardier than any other breed. I very seldom lose any lambs. They use less feed in proportion to their weight than the Cots-

[*Mr. Anderson.*]

wolds. I have tried the two breeds together; the Southdowns are not so large proportionately as the Cotswolds, but I think they come to maturity sooner. I have never sold any for butchering purposes.

CLIP OF WOOL.

Two Cotswolds would produce about eight pounds of wool each—sixteen pounds. The average price of that would be about 28 cents. Three Southdowns at the same age would average four and a half pounds of wool each—thirteen and a half pounds. This would sell at an average of 38 cents. I have never fed my sheep for butchering, but always sold them for breeding purposes, so that I cannot give an estimate of the difference in the value of the mutton of two Cotswolds and three Southdowns. I have never had any first crosses of Southdown rams with Cotswold ewes, but my ram got among my neighbour's Cotswold sheep, and he had some crosses which turned out to be magnificent. The wool from that cross would be the medium wool which sells on the market at about three cents a pound less than pure Southdown wool, and the fleece would weigh from six and a half to seven pounds. Last year 27 cents a pound was obtained for such wool, when long wool was selling for 18 or 20 cents, and when you take into consideration the larger quantity of wool, it makes a vast difference. I have had no trouble in getting a good sheep from a small ram crossed with a large ewe. I do not approve of using ram lambs at all.

OBJECTION TO RAM LAMBS—BREEDING.

To Mr. Dymond.—My objection to using a ram lamb is that it has not come to maturity. The effect would be seen in the quality of the lambs, not in their numbers. The Southdowns are the most prolific sheep in this way, they are the hardest, and you hardly ever lose a lamb; besides they generally have twins. I don't think the Cotswolds as a rule have twins. I think feeding at the time of conception has an effect. I am told that if ewes are served when they are feeding on rape, they are almost sure to have twins. If the ewe is well fed, her having twins does not diminish the size of the lambs; but she must be well fed. Mr. Stone said that the Southdowns do better than the Cotswolds on high stony land; but my land is generally low and flat; they seem to do well on almost any kind of land. I have not crossed the Leicesters with the Southdowns.

GOITRE AMONG SHEEP.

I have never had any diseases among my sheep. My neighbour, Colonel Saunders (he is dead now), could not keep sheep, because of their getting goitre in the neck. I have never had any trouble in that way. His sheep were Cotswolds, and there may be a greater tendency to disease in one breed than in another; but I think the cause of the goitre in Colonel Saunders' sheep was the water. He had not got a good supply of water; he had to pump all the water he used. He did not try any of my sheep upon his farm. I have not tried the Oxford Down. I had as many as fifty or sixty sheep in one flock. One ram will serve that many perfectly well. In the old country we used to serve sixty or seventy with one ram.

SHEEP MORE PROFITABLE THAN CATTLE.

I have never gone much into thoroughbred cattle. I tried a few when I started first; but I consider that sheep are a great deal more profitable than cattle, and they keep the land clean and their manure is very valuable. I have not gone into figures to ascertain that, but I go by general results. Sheep come more quickly to maturity, and you can increase your stock much more quickly. You can keep about five or six Southdowns to one steer or cow on the farm. I know that you can pasture six sheep more easily than one cow or steer, and sheep are as easily wintered as cattle.

To Mr. Brown.—I do not give breeding ewes any grain in winter till after they lamb.

[*Mr. Anderson*]

WATERING—SALT—TICK.

To Mr. Dymond.—In winter time I allow my sheep to get out every fine day. I keep the rams by themselves, and the breeding ewes by themselves. They all have free access to water, and I believe that is a great thing in keeping sheep. I keep rock salt before them all the time, in the fields and everywhere else; they are very fond of salt.

To Mr. Whitelaw.—Some of the sheep, if they get poor in the spring, are subject to ticks. I have used McDougall's sheep dip to destroy the ticks; it is a very valuable preparation. I used Miller's dip, but it is not so good. There is a good deal of carbolic acid in McDougall's dip, and if I rub the legs of the sheep with it it keeps all the flies off.

BEST SHEEP FOR CROSSING ON COMMON STOCK.

To Mr. Brown.—I have attended a good many sales, and I think the Southdown shearing always brings as good a price or better than the Cotswold. The Southdown is decidedly the best sheep for crossing on the common stock of the country for producing good mutton and good animals for the European market.

BERKSHIRE AND ESSEX PIGS.

To Mr. Whitelaw.—I consider it profitable to raise pigs in this country for breeding purposes, but not for butchering. I have used the smaller breeds—Berkshires and Essex, and Mr. Brown's breed, the Windsor. In winter, when feeding pigs for family use, I always cook the feed. I raise entirely for family use; I have not sold a pig on the market for eight years. I sold a few when they were about \$8 a hundred. A good breeding sow can generally have two litters in the year—one early in the spring, and another in the fall. I have had both Berkshires and Essexes until recently, when I have given my whole attention to the Essexes. I think they are more profitable, for the amount of feed consumed, and come earlier to maturity. I can generally sell all I can spare. Prices are not so high as they were. I used to sell to the United States people a good deal, but lately Canada has been my chief market. I give the preference to the Essex for early maturity. If I were selling on the market, the Berkshire might be more profitable, but for family use I think the Essex is more profitable.

To Mr. Brown.—I find the Essex to be as hardy and prolific as the Berkshire. I sent a sow to the exhibition here last year suckling thirteen pigs. I think a well-bred Essex will have less offal than a Berkshire. They are getting heavier than they used to be. Their bone seems finer, and the quality of their meat is, I think, superior to that of the Berkshire. I have stuck to the Essex now entirely for two or three years. I have not used the Essex to improve any other breed. When I had both Berkshires and Essexes I crossed the two breeds, and got a splendid cross. There are dozens of my neighbours bringing their Berkshire sows to my Essex boar, and they prefer the first cross to the pure-bred animal for feeding purposes.

To Mr. Dymond.—I don't think pork raising has been profitable in Canada during the last few years, when the price of grain is taken into consideration. I think our coarse grains can be better applied than feeding them to hogs. We cannot compete with the large corn growing regions of the west in that respect.

JAMES ANDERSON.

MR. WATT'S EVIDENCE.

SHORTHORNS—COTSWOLDS.

JOHN WATT, of the firm of J. & W. Watt, Salem, was called and examined.

To Mr. Brown.—I have been a breeder of pure-bred Shorthorns for twelve or fifteen years. We have never imported any ourselves. In choosing animals we always looked for the best quality, fine boned, heavy fleshed animals, and good milkers where we could get them. We have bought these wherever we could get them to suit; we brought over a bull and five females from New York. In the selection of animals I have paid attention both to points and pedigree; we wanted good pedigree, but we must also have the points. I would not take an inferior animal with a pedigree, or a good animal with an inferior pedigree.

BOOTH AND BATES CROSSES.

I think the two families of Shorthorns—the Booths and the Bates—should be crossed to produce the best animal. The Booths are generally reckoned to be heavier fleshers, and the Bates are generally reckoned to have more style and to be better milkers. I have tried to obtain both good milkers and good fatteners, but I would rather have a fattening animal than a milker. We have got some very good milkers; those we brought from the States were extra milkers. We have been very successful in respect of having sure breeders, but we sometimes have had to use young bulls. We find that when a bull becomes three years old he won't catch so surely. We have been feeding steers for a long time; but since we have gone into the breeding more largely we have not fed very many. Sometimes we feed about ten or a dozen, but formerly we used to feed about twice that number.

FEEDING STEERS FOR MARKET.

Like Mr. Armstrong, we have been turning out our steers at two years or two years and a half old; I am an advocate of early maturing. The average weight of these cattle has been thirteen or fourteen hundred pounds. The reason we get them out at that age is that we do not think it pays to keep them longer. We have sold a pure-bred fattened animal at three years old for \$300. We did not know her weight, but it was about 2,000, or perhaps not quite so much. In the same year we sold one grade about fifteen or sixteen months old and weighing ten hundred, and we got \$50 for her. Animals that milk well do not generally take on flesh so well as those that milk lightly, although we have some that take on flesh very well after their milk dries up.

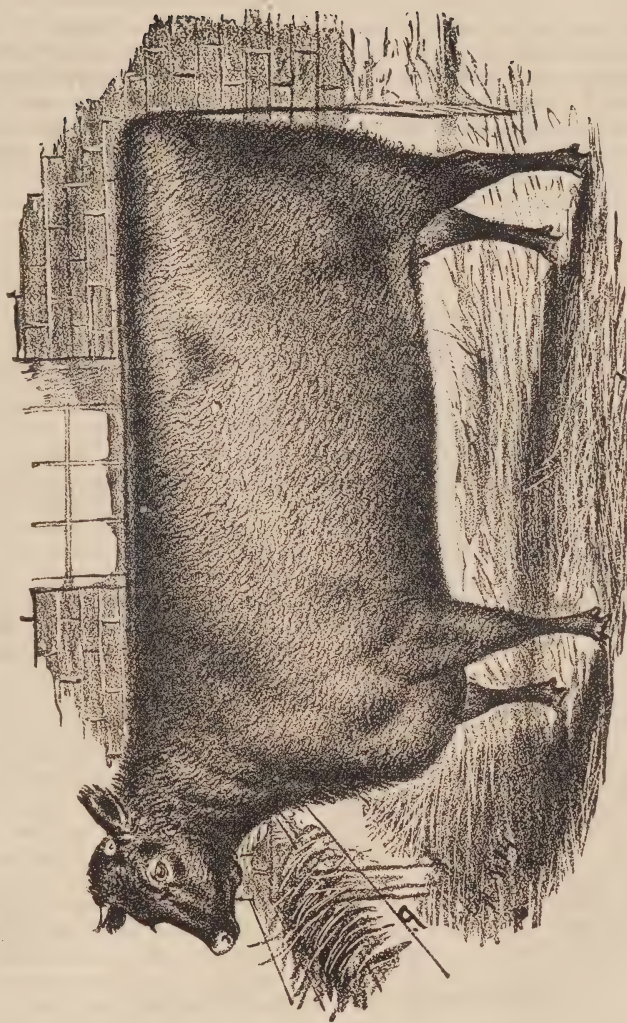
SECOND OR THIRD CROSSES BEST.

Most of our animals are second or third crosses; I prefer them to the first cross. You can get a first cross sometimes to do well, but, as a general rule, a first cross is not so sure as a second or third.

MANAGEMENT OF CALVES—FARM STOCK.

During the first summer, we generally let the calves suck, and during the next winter we feed a little bran, meal, cut turnips, and hay, and let them run in the boxes loose, and go with the cows at all times. We generally let the young calves dig the turnips, but cut them for the yearlings with hay and straw. In the second year the turnips need to be cut, and then we begin to feed about a gallon of meal twice a day—that is, two gallons a day, and perhaps feed a little heavier towards the spring. At present we have about 30 pure-bred animals. Our farm is 220 acres. We follow mixed farming as a whole. We have

[*Mr. Watt.*]



SHORTHORN HEIFER.

been able, generally, to keep between 40 and 50 head of cattle altogether from the produce of our own farm. We also keep about 40 or 50 head of sheep. Our stock of cattle includes pure-bred cattle and grades. I believe in growing roots for feeding purposes; I do not believe we could get on without them. We have not more than 188 acres of cultivated land, and 14 acres are planted with roots.

FALL CALVES.

To Mr. Whitelaw.—I prefer to have my calves come in the latter end of the year—from November to January; and the steers which I speak of as being two years old, I mean the steers that are ready in the next spring after they are two years old. During the last two years we have had a great demand for good bulls. I think the European market has had the effect of causing farmers to pay more attention to the improvement of their stock. We usually sell our bulls to Canadian farmers; but latterly a number to Nova Scotia. We have never any difficulty in selling them. I have calculated that about ten years ago it cost about \$2.50 a week or \$10 a month to feed steers. We used to buy corn for feeding purposes, but during the last two years we could not touch it, owing to the duty.

CATTLE FEED.

To Mr. Dymond.—We can buy peas at present cheaper than we can buy corn. In the beginning of 1878 we could buy corn at from 47 to 50 cents; at present we cannot get it under about 58 cents, and we can buy the very best peas at 60 cents. In 1878 the peas were about the same price. The present price of the corn is so nearly equal to the price of peas that it is not worth while to buy it for feeding purposes, as a bushel of corn won't feed so well as a bushel of peas. I should say that it would take more than 125 bushels of corn to equal 100 bushels of peas for feeding purposes. If corn could be bought for 47 or 50 cents, I think it would be profitable to use it as against peas at 60 cents. The corn I used was imported Western corn. I did not buy any in Canada.

To Mr. Whitelaw.—I give the cattle about a bushel of roots a day during the winter. When I stall-feed them, I commence with straw and chaff, and turn to hay when they have been in for a month or six weeks. I continue to give about the same quantity of roots right along. I commence with about two gallons of meal, and work up to probably two gallons and a half at the last.

COST OF FATTENING A STEER.

To Mr. Dymond.—When I spoke of it costing about \$2.50 a week for fattening a steer, I was referring to an animal two years old; that would be the cost during the last six months of its life. We generally put them in in the fall, and keep them in till Easter. The cost for the whole time would be about \$60, I should think. I think it would pay to buy steers in the fall for \$35 or \$40 and fatten them till the spring. In April they would realize five and a half cents a pound to the shipper, and might weigh 1,400 pounds. My calculation of the cost is based on the idea that you would have to buy all your feed; but the cost would not be so great if you were feeding from what you raised at home, as by keeping cattle we are enabled to use up a quantity of material for which we might not be able to get a market—and then we are improving the farm also. So that if you do not get a profit in one way, you do in another. My calculation is also based on the idea that hay is worth \$15 a ton; at present it is worth only from \$7.00 to \$6.00 a ton; and the cost of hay would be an important item. The price of peas remains about the same—60 or 65 cents. Turnips we used to put on the cars for the United States at ten cents a bushel; this year they are shipped for six cents. I have estimated the feed in this calculation at top market prices,

To Mr. Whitelaw.—I have never calculated the cost per acre of raising turnips; with reference to hay and turnips, in addition to the cost of raising them, I would have to calculate the labour of bringing them to market. I have seen hay sold in the barn at \$2.50

[*Mr. Watt.*]

a ton. My calculation of the cost of feeding is what it cost when I was feeding some time ago. I have seen it cost \$15 a month to feed cattle. I could not give the present cost of feeding, but it would be considerably less last year. We do not feed on the same principle now, but generally feed some of our own material. We have bought animals from Canadian breeders. I think there are just as good animals to be got in Canada as there are to be imported, but I generally buy from imported stock, and I believe in continued importation. I agree with Mr. Armstrong that it is more advantageous to export animals to England at from two years to two and a half old, and that they should be as nearly thoroughbred as possible.

PRICE OF BULLS.

We have been getting from \$100 to \$200 for bulls twelve or fifteen months old. I do not think a bull three years of age is so sure as a younger bull, although it depends very much on circumstances whether a three-year old bull is useful or not. I think 60 or 70 cows are plenty for one bull during the season. If he is not used more than that, he should last until he is six or seven years old, without losing any of his prepotency.

FARM MANAGEMENT.

To Mr. Brown.—My farm is a clay loam. It is at present in pretty good condition. I have been able to improve it without the use of artificial manure. I have never used superphosphates. I have used plaster, but I have not used any for the last three years. I have used salt for turnips. I do not think we could keep up the fertility of the farm without growing turnips. They are a hard crop on the land, but they return very much. We generally plough down all the tops, and I think in that way the turnips give back to the land about as much as they take off.

COTSWOLD SHEEP.

To Mr. Whitelaw.—The only sheep we breed at present are Cotswolds. We used to keep Southdowns, but we gave them up because we thought the Cotswolds were more profitable. Our market for them is generally about home. We have also sold to go to Colorado and Illinois. We sell most of our ram lambs for breeding. We realize from \$10 to \$15 for them. We could not get the farmers to appreciate Southdowns, but I think they are now getting more into vogue. I think the Cotswold is calculated to improve the common stock of the country. I keep about 26 ewes. I have had no experience with any other breed besides the Cotswold and the Southdown.

To Mr. Dymond.—I think the Cotswolds improve the weight of the fleece, and they give a large carcass, but they do not come to maturity so quickly as other breeds, and their mutton is not so fine as that of the Southdown. There has been a change recently in the demand for wool, but the fleece of the Cotswold will still bring more than the fleece of the Southdown. I have not made any calculation of the relative cost of keeping a Cotswold and a Southdown. The Cotswold ewes are very good nurses. They are not so prolific, however, as the Southdowns. We think we are doing very well if we raise on the average about one lamb and a half to each ewe. We have done that during the last two years. I think we could raise more from Southdowns.

To Mr. Whitelaw.—I think we average between seven and eight pounds of fleece this year.

JOHN WATT.

MR. PARKINSON'S EVIDENCE.

LEICESTERS—SOUTHDOWNS.

LAZARUS PARKINSON, of Eramosa, was called and examined.

MERITS OF THE LEICESTER.

To Mr. Whitelaw.—I have been for about thirty years a breeder of Leicester sheep. I have had more experience with the Leicesters than with any other breed. They are a sheep possessed of good feeding qualities, early maturity, and the power of transmitting their character, that is, of breeding true to their kind.

VARIETIES OF LEICESTERS.

I wish to explain myself here. I think there are varieties in the breed of Leicesters as there are in the Durhams and other classes of thoroughbred stock. The small fine Leicester, which some people call the Bakewell, has been bred in and in with the object of obtaining fineness of quality, but it is too tender and too small a sheep for this country. But the Yorkshire Leicesters, for instance, in which breeders have largely retained the quality and symmetry of the Bakewells, and also their feeding qualities, early maturity, and an increased fleece of wool, are the class of Leicester sheep which I consider adapted to this country. The fine English Leicester is a good symmetrical sheep, but it is too small and tender to be a profitable sheep for this country. The same qualities which have been obtained to some extent by improving the Yorkshire Leicesters are found in the Border Leicesters, only perhaps the Border Leicester does not hold its wool so well or carry so heavy a fleece as the Yorkshire Leicester; but they are both good mutton sheep, both come to a good size, and both are as hardy as any other long-woolled sheep, and they are as free from disease as the Cotswolds or the Lincolns, or any other long-woolled breed. The Yorkshire and the Border Leicesters are about equal in size, and there is very little difference between them and the improved Lincoln, which has been improved by the use of Leicester blood—so much so that a few years ago when Professor Buckland was in England and was reporting for the press what he saw there, he testified that the difference between the improved Lincoln and the Leicester was so small as hardly to be distinguished; and according to Youatt's testimony, all the long-woolled sheep in England owe their improvement to the Bakewell Leicester.

LINCOLN BLOOD.—BREEDING.

I think there is something of Lincoln blood in both the Yorkshire and the Border Leicesters; I think they owe their size to the Lincoln. A man in breeding has certain objects that he aims at, and where he has material enough to select from, he is able in the course of a number of years, even by breeding from the same original flock, to produce quite a distinct character. Youatt gives an instance of two men who, there was no doubt, both bred from the Bakewell stock; one aimed at getting large size and a full fleece, and the other aimed at symmetry, which is generally accompanied by a small animal. Neither had any out crosses, and each succeeded in giving the character to his flock which he aimed at, although there could be no doubt that they both had come from the Bakewell stock. The Bakewell sheep are a tender sheep, not very prolific, and their lambs are delicate and small. I have not had much experience in crossing the Leicesters on the common sheep of the country, but some of the farmers around me have been trying them. One man, for instance, had been using Cotswold rams, and some years ago said that when he wanted to kill a shearling wether of that breed for the men who were working for him in the harvest it was not in a fit condition. He wanted to have

[*Mr. Parkinson.*]

them always ready ; but this year he had none that were fit to kill. I don't think he has used a Cotswold ram since, and he is a man who considers pretty well the profits and the advantage of anything he goes into.

USE OF LEICESTER RAMS.

From the limited observation I have had, I would give my opinion that so far as this region of country and the counties north and west of us are concerned, the common farmers of the country employ more rams of the Leicester and Lincoln breeds than they do of any other long-woolled sheep, and I think they do this after having given the others a fair test. I don't think the Cotswolds occupy the same position in the estimation of the farmers of this country that they did a few years ago.

IMPROVEMENT OF COTSWOLDS.

The great demand for Cotswold sheep has been from the United States. The Cotswold sheep have been much improved lately. What have been imported in recent years are far superior to what were formerly imported. They are better woolled sheep, and have finer quality ; but from my observation of the Cotswolds—I may be mistaken, but I have no prejudice against them—the produce of the Cotswold thoroughbreds are not so uniform in character as the produce of well-bred Leicesters. Both flocks being thoroughbred, there would be more inferior lambs in a Cotswold than in a Leicester flock.

EARLY MATURITY OF LEICESTERS.

The former also require a longer time to come to maturity, and they will not be so finished at the end of a year or a year and a half as the Leicesters. The Leicesters are ready to kill at any age. A third cross Leicester wether should be got at a good weight for the European market at a year and a half old ; at a year old I think it should weigh 140 or 150 pounds. Of course that is when the wool is on. Two years ago I had four wether lambs—grades pretty well bred—that I bought. Sometime in the month of February I sold these lambs, along with six ewe lambs, for \$74 ; that is, I got \$8.00 apiece for the wether lambs, and \$7.00 a piece for the ewes. They were about eleven months old.

FIFTEEN EWES TO A 100-ACRE FARM.

A man with a 100-acre farm could not afford to have more than fifteen or twenty acres of permanent pasture. He could not keep more than fifteen ewes in addition to his other stock on that much land ; I don't think perhaps that the average would be more than twelve ewes to the 100 acres. A farmer with twelve ewes would do very well if he would raise from fifteen to eighteen lambs a year. It would not do to keep them till they are two years old, because that would make the flock too large for the pasture. So long as the market remains as it is at present, I think the ordinary farmer is consulting his own interest and profit by selling his lambs sometime between the ages of three or four months and a year old. If he has his lambs come very early and wishes to dispose of some of them as early lambs, it is sometimes an advantage for him to do so. If he has kept them until the winter it would be perhaps an advantage to feed them until there was a demand for them in March or April. A growing animal, whether it is a calf or a lamb, will increase in weight faster when it is young on the consumption of the same amount of food than it will when it comes nearer to maturity. Some lambs will gain a pound a day. A Scotchman who had fed cattle in the old country told me that they considered there that an ox which when feeding gained a pound a day was doing well. If a lamb can be made to gain a pound a day, how much less food does it require to make a lamb gain that pound than it does a mature ox ?

[Mr. Parkinson.]



LEICESTERS.



LINCOLN RAM.

NEGRETTI RAM.

THE OXFORD DOWNS.

I think if the Oxford Downs were raised in this country they would command and deserve a higher price than the sheep that are at present shipped to the old country ; but whether the difference in the price obtained would be enough to make it a paying object I cannot say. I have had no experience with them—the breed is only a recently introduced breed—and I do not know whether they possess prepotency enough to impress their characteristics on their offspring with a reasonable degree of certainty. It requires a really thoroughbred animal to do this.

SELLING THEIR COARSE GRAINS.

If an ordinary farmer made preparations, he could afford to keep his lambs longer than the fall. A great many farmers sell all their coarse grains, and then they have to sell their lambs, and they will be compelled to do it, so long as they continue the same system. If they would keep their coarse-grains and turnips on the farm, and feed them to their stock, they would not only gain by their stock, but in the manure which they would have to keep up the fertility of the soil.

WINTERING SHEEP.

In the winter I prefer keeping my sheep in open sheds, with a yard fenced closely enough to protect them from the wind ; in this way they can have plenty of exercise where the air is always pure. There is no class of stock that is more sensitive to foul air than sheep, and if they are confined in close pens during the night you will find a bad odour arising from them in the morning. Besides, if sheep are shut up so that they sweat and get their wool damp, and they are then let out with this dampness on their wool, they are very likely to take cold ; but as long as you keep their wool dry and protect them from the wind they will stand the cold weather very well. On calm nights in winter I have found my sheep outside in the open yard where they preferred to be rather than in the shed. I am more a breeder of sheep to sell to the farmers than a feeder. I have principally bred for breeding purposes.

SALES TO THE STATES.

My sales of rams have been made principally to farmers in Ontario, Quebec, Nova Scotia, and New Brunswick ; I have also sold some to go to Oregon, Washington Territory, California, Michigan, Illinois, Ohio, and New York. I have sold more rams in Canada than in the United States. I do not approve of breeding from a ram lamb, except with a limited number of ewes. I prefer breeding from a pure bred Leicester or improved Lincoln in all cases.

YORKSHIRE AND BORDER LEICESTERS.

To Mr. Brown.—My Leicesters are more of the stamp of the Yorkshire Leicester than anything else ; some of my lambs and shearlings have something of the Border Leicester in them. There is some difference between the Yorkshire Leicester and the Border Leicester, but whether the difference has been caused by the breeders or not, I do not know. The Yorkshire Leicesters are darker coloured on the head than the Border Leicesters ; they are shorter in the neck, and they are better filled up in what we call the collar, that is, where the neck joins the shoulder, and the neck never rises so far above the body as it does in the Border Leicester ; the neck is more on a line with the back. The Yorkshire Leicester is also, I think, a little fuller or more sprung in the fore ribs. Its fore legs should stand wide apart, and it should grow the wool nearly down to the knee. While the wool of the Yorkshire Leicesters is not so thick set they carry it closer up about their neck, and more underneath than the Border Leicesters. I think it is a good

[*Mr. Parkinson.*]

many generations since the Lincoln has improved the Leicester. I think they employ the improved Lincoln to some extent yet in Yorkshire, but not directly. Their object in doing that is to impart vigour, and to keep up the size and weight of the fleece.

LEICESTER CROSSES ON COMMON STOCK.

A cross of a Leicester ram and a common Canadian ewe would not bring, perhaps, so high a price as a wether from any of the Down breeds, but I am satisfied that if well-bred rams from Leicester sires were made into wethers, and kept until they are a year and a half old, they would find a ready sale in the British market. They would have a heavier weight at that age than any of the Downs, unless perhaps the Oxford Down. From what I have seen and read of the Oxford Downs, some of them come to pretty heavy weights. In either cattle or sheep, if you want to breed good healthy animals, the male animal must be pretty well matured. A lamb coming early, and being of a breed that matures early, would, I think be a safer animal to breed from, to a limited number of ewes, than one which does not mature so early; and I am satisfied of this, both as regards cattle and sheep, that male animals that are overwrought, or that have too much service to do, will not get stock of equal quality with what they will get if they serve in moderation.

NUMBER OF LAMBS PRODUCED.

I have a record of the number of lambs produced by my flock each year for the last five years. It is as follows: From 20 ewes in 1876, 36 lambs; from 20 ewes in 1877, 33 lambs; from 23 ewes in 1878, 31 lambs; from 22 ewes in 1879, 30 lambs; and from 20 ewes in 1880, 28 lambs; making a total of 105 ewes and 158 lambs. That is fully one lamb and a half to each ewe, and these are the actual figures of the lambs I raised during the past five years. I have had no trouble in the way of diseases in my flock.

LEICESTERS TRUE BREEDERS.

When I say that the Leicesters are true breeders, I mean that they reproduce themselves from the original type in every respect; they breed after their kind, and there are fewer inferior animals among them than among other breeds, although there will occasionally be a comparatively small lamb. But as a general rule they are more uniform than some other breeds. In speaking of the Leicester sheep and their adaptability to this country, I do not suppose that they are fit for a mountainous region where the pasture is thin, and where they would have to travel over a long distance to obtain their sustenance; but they will thrive where the soil is moderately good and will produce a fair pasture, and where they can obtain their supply of food without too much labour and trouble.

LEICESTER WOOL.

The reason why Leicesters do not keep up their wool so well as some other breeds, I think, is this, that mutton sheep are valued more highly in the old country than here, and it is generally found, by sheep men, that a sheep carrying a comparatively fine and light fleece will fatten faster than a sheep carrying a coarser and heavier fleece, and as there is more difference in the old country between the prices of wool and mutton than in this country, they have not regarded the loss of a little wool as being an offset to a sheep that would fatten quickly and come early to maturity. I think that the improvement in the Leicesters has been largely owing to the breeders pursuing a different object from what was followed immediately after Bakewell's time. Bakewell, who originated the Leicester breed of sheep in the middle of the last century, attempted to get a sheep that would mature early, without regard to size or to the weight of fleece, and breeders afterwards sought to obtain greater size, and, I think, used the Lincoln in doing so.

[*Mr. Parkinson.*]

ORIGIN OF BORDER LEICESTERS.

To Mr. Dymond.—There is a difference in regard to style of countenance, fleece, and formation of the neck, between the Border Leicester and the Bakewell. The origin of the Border Leicester is a matter of record, but the record is disputed. There was something in the *Mark Lane Express* a few years ago about the Border Leicesters, and a writer, reviewing them last year as they were exhibited at the Royal Show, said, that looking over the Border Leicesters and the Lincolns, as they were standing together, he saw a great deal of similarity in them. One of the reporters of the Royal Show, also, writing for one of the papers, and in speaking in favour of Border sheep, expressed the opinion that they had some Cheviot in their composition. From what little I have seen of the Border Leicesters in this country, I think they have the power of perpetuating their kind. They have all the characteristics of a well-established breed. Bakewell improved his sheep by selection, but it is not known how he did it. Breeders, by seeking to obtain different qualities, and by selecting their ewes and rams with that view, might produce in the course of generations, two different types from the same original stock, and that might account for all the difference between the Border Leicesters and the Bakewell Leicesters.

To Mr. Whitelaw.—I think the Yorkshire Leicester is more similar to the improved Lincoln than the Border Leicester.

KEEPING BREEDING EWES IN WINTER.

In keeping my breeding ewes in winter I feed them with pea-straw in racks, and alternate this with hay. At first I give them a good deal of pea-straw, and give them a feed of hay perhaps three times a week, because they will eat hay better after they have had pea-straw a while, and will take to the pea-straw better after they have had hay a while. In addition to the pea-straw I feed breeding ewes turnips once a day—about two bushels of turnips to twenty ewes; and in addition to that I give them once a day a small feed of grain—not a pint each,—with a little chopped stuff and bran. After they have lambed I give them more turnips—twice or three times a day—and all the clover hay they will eat; and in addition to that I boil some oats and flaxseed and mix it with cut hay, bran and chopped stuff, and give them two feeds of this a day.

CLIP OF WOOL.

About two years ago my flock averaged a little over eight pounds of wool to the fleece; last year the average was between seven and eight pounds. If I made wethers of my ram lambs, and had as many shearlings as I had breeding ewes, it would increase the average weight of the wool, because shearlings—the lambs that come early, in the latter end of February or March—have more than a year's growth of wool, and being well fed, their wool keeps on growing. I don't think the wool of breeding ewes, after they have lambed, increases in weight, while the wool of young sheep does increase in weight. I have had shearlings that would average between eight and ten pounds a fleece. Between seven and eight pounds would be a general average.

EFFECT OF TURNIPS AS FEED.

I have seen some bad results of feeding turnips to ewes, when they get heavy with lamb, in too large quantities. I have seen them lie down and show an indication as though they were going to invert the womb. Good, sound, sweet turnips, when cut up for them, they will eat very readily, but it is not well for them to get all that they would eat.

A HERD OF SHORTHORNS.

I have been a breeder of fullbred Durhams to some extent. Several years ago I had about twenty head of thoroughbred cattle, but a year or two after the New York [Mr. Parkinson.]

Mills sale, I sold out the greater part of my thoroughbred stock. I have now six thoroughbreds, all pedigree animals. I keep a private record of the pedigrees of my grades for my own benefit, and have not entered them in the Canadian Herd Book. I have grades with seven or eight crosses that were never recorded at all; an animal with seven crosses is about equal to a thoroughbred. A year or two ago Mr. George Coughlan bought one of my thoroughbred heifers for an American gentleman from New York State. I was feeding her for a fat beast, and he wanted me to have her entered. I had the record in my book, and I had no trouble in getting a certificate and sending it over to him; but any that I keep for myself I do not enter. If any person wants to buy one of my animals, and will give a better price for it if its pedigree is entered, I will then have it entered, but otherwise it would hardly pay me to do so. My bull calves I have not sold to my neighbours, but I have sold some to Agricultural Societies in the county of Kent, and to farmers in several other counties in Ontario. I cannot say that I get such prices as Mr. Hunter obtains; I think I could sell a good bull calf for \$100, and it will pay me better to sell bull calves at that rate than to raise them and sell them as steers for beef.

To Mr. Dymond.—A male animal with seven crosses ought to be good for breeding, when an animal with four crosses is admitted into the Herd Book as thoroughbred. I have never used any of them as bulls for breeding purposes, and whether they would have the same power as a thoroughbred I could not say. It would be a very difficult matter to express an opinion upon, because even all male thoroughbreds are not equally good stock-getters. You would have to try a considerable number before you could come to a right conclusion. The bulls which I have sold to the Agricultural Societies have been for the use of their members. I think that practice is followed to some extent in the west, and in Nova Scotia and New Brunswick.

To Mr. Whitelaw.—I let the calves follow the cow throughout the summer. I feed the bull calves a little extra during the winter. They are sold sometimes between January and the first of April. I have never tried any other breeds of cattle as thoroughbreds besides the Durhams. A good many years ago my father got a thoroughbred Devon bull from the stock of what used to be called Gentleman Jackson, and we used that bull for some time on Canadian and grade cattle. I don't think there were many Durhams to be got in the country at that time. I do not consider the Devons equal to the Durhams.

FEEDING CATTLE FOR MARKET.

I have fed cattle for market to some extent. This year I fed six, and sold them to Mr. Craig, to ship to the old country, for \$5.75 a hundred. Four of the cattle were of my own raising, the other two I bought. The latter were grades, got by a bull bred by the Honourable Mr. Christie, and they were very good animals. They were three years old, or a little over, when I sold them. Most of them were heifers. I cannot tell exactly what they weighed, but one of the three year old animals on the first of January weighed 1,580 pounds; the heifers, I should think, weighed something like 1,300 pounds, and the steers, I suppose, about 1,600 pounds. I got \$5.75 a hundred for the lot, that would be about \$92 for each animal.

STALL FEEDING.

In stall-feeding I put them up in the second week or in the middle of November, and they are stall-fed about six months. I do not pursue a regular system of soiling, but in our normal seasons, when we have dry weather during the greater part of July and August and our pastures get poor, I raise some fodder corn, and after the pasture gives out I feed the cattle on that. To prevent the pasture getting too short I have been in the habit of growing rape, and of turning the cattle into that in good time, and they will increase upon it fully as fast as upon the regular pasture, especially if they are fed good, bright oat-straw or hay in connection with it. The rape lasts them until it is time to shut them in for the winter. If I am preparing them for the European

[*Mr. Parkinson.*]

market I stall-feed them about six months in the year. When I commence stall-feeding I give them oat-straw once a day, hay once a day, meal twice a day, and turnips, I think, three times a day. In years when corn was cheap, or when we had a drouth, so that our crop of oats and peas was short, I have bought corn and bran to a limited extent. If corn was as cheap as it used to be I would sell some peas and oats and buy corn—not that I consider that corn alone is better or as good feed as peas alone, but I think that corn and oats and peas ground together are a better feed than any one of them alone, because there is more fattening quality in the corn and more of the properties of muscle in the peas. If corn was down to about 45 or 46 cents, I would buy it to mix it in that way.

KEEPING UP THE FARM.

If a farmer wants to keep up the quality of his farm he must feed his coarse grains. Without going into figures, or making any calculation, I can say this: that, in our neighbourhood, all the men who have raised turnips and fed their coarse grains and hay on their farms, and have occasionally bought a little bran and other kinds of food, have done well. I don't think any of these men have got mortgages on their farms, but some of them have got mortgages on other people's farms. I want to say this also: an idea has got abroad that so much of the land in Ontario is so badly farmed that it has become much exhausted and run down. I think that is true in reference to a large proportion of the land. People who sell their hay and coarse grains, and who do not properly cultivate their land, have their farms in a pretty bad state, and between the wild mustard, Canada thistles, and other weeds, have their farms pretty full of flowers at this season of the year. But those who have raised cattle and sheep and hogs, and in that way consume their coarse grains, and apply all the manure they can to their lands, have farms which, in my opinion, will grow now as good crops as they did twenty-five or thirty years ago, all other conditions being equal.

FERTILIZERS—PLASTER—SALT—BARN-YARD MANURE.

With regard to commercial fertilizers, I have used none to any extent, except plaster and salt. In connection with these fertilizers, there is one point which I have not seen much enlarged upon in our works in agricultural chemistry. Suppose it were possible to obtain a manure that would restore to the land all the elements of fertility that are necessary to the production of a crop; if that manure failed to have a mechanical effect upon the soil, it would comparatively fail in its end. One great advantage in our barn-yard manure is that it not only brings to the soil the fertile elements necessary to produce a crop, but it has a mechanical effect in keeping the soil open and porous, so that the air and the gases, and the other influences that come from the atmosphere, can enter into the soil, and the moisture from below can ascend up through it. There is many a field of fall wheat that is comparatively a failure which, if it had had a few loads of manure put upon it last fall, middling near the surface, would have been saved from winter killing and would have produced a good average crop of wheat. I think barn-yard manure is our great reliance.

INSECT PESTS.

To Mr. Dymond.—We have more trouble from insects in Ontario at present than we had formerly—I mean insects peculiar to a certain class of grain. I consider the yellowness of the spring wheat, and its breaking down, to be largely due to its being preyed upon by the Hessian fly. And very few of us know the extent to which we lose in the head of the wheat in consequence of the midge. It may look fair enough in the field, but when you put it through the screen there is a great deal of the grain that is injured by not coming to the right size, and if you look at the heads, you will find many places where the kernels are wanting altogether.

[*Mr. Parkinson.*]

GREEN FODDER—CLEARINGS.

To Mr. Brown.—I have found it a decided advantage to grow green fodder crops to assist when pastures are dry, even if I give the fodder to the cattle in the fields. A question which you have asked has been as to the effect of clearing away the woods on the fall wheat. In one aspect it has been an injury, and in several others it has been a benefit. I remember distinctly that when we first settled in [the woods, there was hardly any article that would fetch cash but fall wheat. It was not then thought that spring wheat could be shipped to the old country, and we tried to grow fall wheat. It was the old red cuffed kind which we raised. Then, when the woods were standing, it did not dry up so quickly as it does now, and the dampness remaining on it caused it so frequently to rust that we had to give up growing it; and if the weather was wet in harvest it was very likely to be injured by sprouting. Another injury which we escape now is late summer frosts, which were more frequent when the woods covered the country than they are now. I have known fall wheat to be often injured by these summer frosts. On the other hand, the injury done by clearing is that it causes the snow to drift in the winter and leave the fields bare, so that the ground freezes to a considerable depth. When the frost gets deep into the ground, and it causes the water in the spring to remain on the surface, this water freezes at night and thaws in the day, and this alternate thawing and freezing does a great injury to the wheat; it makes the surface of the ground almost like mortar, and when the air is driven out of the soil, it binds and cracks so that hardly anything can grow on it, unless it has some manure to keep it open.

FIRST CROSSES.

To Mr. Whitelaw.—The first cross from a thoroughbred Durham bull and a common cow may sometimes be a good feeding steer, and of a good size; but to say that a first cross as a general rule is equal to more advanced crosses I think is not correct. For a grade that has six or seven crosses in it breeds more like a thoroughbred. The further advanced you are towards the thoroughbred the greater security you will have of obtaining animals of uniformly good quality—that is, by continuing to use none but thoroughbred male animals.

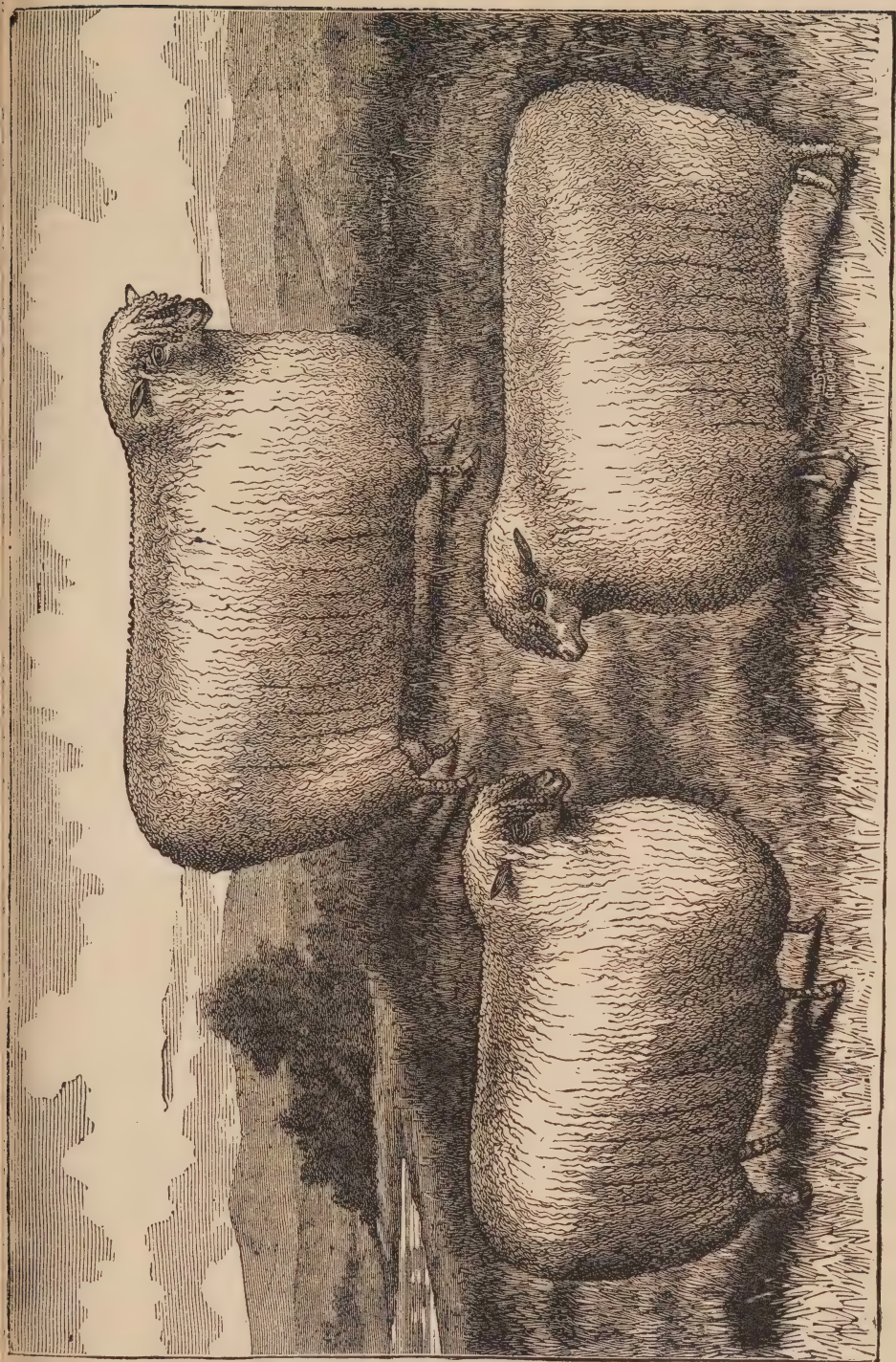
SELECTION OF BREEDING HEIFERS.

I think the most profitable course for the general farmer to pursue for raising cattle for export purposes is to breed from thoroughbred bulls only, and to select the heifers produced by these bulls for breeders. In some seasons I have had some difficulty in getting my cows to breed; I think that is sometimes owing to the season, and sometimes to the male animal having been overworked. My store cattle are composed of yearlings, and those coming two years old, and breeding cows.

FEEDING STOCK.

The cows get rather less than a bushel of turnips a day, divided into two feeds, and when we are threshing we save all the wheat-chaff and the oat-chaff for them. At noon we give them something like a bushel of chaff; and all our store cattle, whether milking or not, get about a quart of chopped stuff every day on their chaff. We generally have them calve in the latter end of February or March, and then we commence giving them hay perhaps once a day and straw once a day, and towards the latter end of the winter they get hay altogether, with chopped stuff and turnips. With reference to the effect of turnips upon the soil, I think they take the vegetable mould out of the soil considerably and make it inclined to bind, but I don't see how we can do without turnips. I consider grass the natural food of stock; there is a certain amount of bulk contained in grass that supplies the nutriment required for each animal. Its stomach and digestive organs are formed for the purpose of taking in food which is of a bulky character, and not food which is concentrated into a small

[*Mr. Parkinson.*]



CUTSWOLD—PROPERTY OF JOHN SNELL'S SONS, EDMONTON, ONT.

compass. My little experience is that if you feed heavily with meal and other concentrated food, and lightly with turnips, and in the spring turn the cattle out to grass, they will not thrive so well as if they had been fed more largely on turnips, and had their stomachs kept expanded to their natural size. I heard an American gentleman saying that he had bought a lot of western American steers at Buffalo in the spring, but that he had found by experience that the Canadian steers that had been fed upon turnips and hay and other bulky fodder would increase faster and do better upon the pastures of the American feeders than the cattle which are fed on western corn. The stomachs of the Canadian cattle had been kept expanded to the right capacity for profitable pasturing; so that if I had a young beast which I wished to fatten, I would feed it during the winter upon turnips and hay and a little chopped stuff, and then it would do well to be allowed to run upon the pasture throughout the summer. I observe that some think that the profitable time at which to sell beef steers is at two years and a half old. I do not doubt that steers well fed all the time might be got in good condition at that age; but I am inclined to think that the bulk of steers would be better if they were kept till they were three years old, because by keeping another winter you can feed them on coarser and less expensive food, and with the addition of the summer pasturing you can bring them to a greater weight at three years old, and of a quality that will fetch rather a better price, without very materially increasing the cost.

To Mr. Dymond.—I think it is possible to get good steers at two years and a half old, but I think the generality of the farmers would do better to keep them until they are three years old.

LAZARUS PARKINSON.

Sittings to take oral evidence held at Toronto, June 23, 1880. *Present*—Messrs. JOHN DRYDEN (Chairman), R. GIBSON, A. H. DYMOND, J. P. WISER, M.P., T. BALLANTYNE, M.P.P., T. STOCK, W. WHITELAW, J. P. McMILLAN, A. WILSON, E. BYRNE, F. MALCOLM and Hon. S. C. WOOD.

MR. JOHN SNELL'S EVIDENCE.

COTSWOLDS—BERKSHIRES.

JOHN C. SNELL, of Edmonton, was called and examined.

FLOCK OF PURE-BRED COTSWOLDS.

To Mr. Dryden.—I have been a pretty extensive breeder, principally of Shorthorn cattle. I at one time bred Galloway cattle, and I have also bred Jersey cattle to some extent, as well as sheep and pigs, which are my specialty now. The varieties of sheep I have bred are Leicesters, Lincolns, Cotswolds and Southdowns. The Cotswolds are the only sheep I am breeding at present. I prefer them for this country, because they are more in demand and bring better prices than any others. I found from experience that they were also the most useful breed to cross upon the common sheep of the country, in order to produce the best results in mutton and wool combined. I think they occupy the same position among the different breeds of sheep that Shorthorns do among the cattle in that respect.

MERITS OF THE COTSWOLDS—IMPROVED WOOL.

The Cotswold sheep crossed on our common sheep produces an animal of excellent quality for the supply of the British market. One advantage in the Cotswold is that it has the early maturing qualities—that is, the improved breed. During the last ten or fifteen years the Cotswold sheep has been very much improved in that respect. As to quality, I think when you get a better feeding animal you get an improvement in the

[*Mr. Snell.*]

quality of the meat as well ; and there has certainly been a great improvement made in the quality of the wool, although I think there is great improvement still to be made in that respect by selecting rams with reference to the fineness of the fleece. One of the objections to the Cotswold sheep has been that their wool is too coarse ; but by careful selection of rams with the finest quality of wool, and with the wool uniform all over them, you can improve the quality of the wool very much in the offspring. The United States has hitherto been our best market for Cotswold sheep ; the Kentuckians have been our best customers, and they are very particular about the quality of the wool, making that a specialty, and we have been trying to breed our sheep to suit the taste of that market, and I am satisfied that in the last ten years we have made a marked improvement in the quality of the wool. There is a difference in the quality of the wool in different parts of the same sheep. There is a tendency to grosser wool on the thighs. I consider that objectionable. The first place where our Kentucky customers catch hold of a sheep is the thigh, and if they find pretty good wool there they judge that it is good all over the body.

SOUTHDOWNS—THE CLIP.

I kept a few Southdowns a few years ago. I am not breeding them at present. If there was any considerable difference in the value of wool, I think it would pay well to raise Southdowns ; but the difference between the prices obtained in the market for fine wool and coarse wool is not so great as to make it an object to breed Southdowns, because you cannot get the weight of fleece in a Southdown sheep that you can in a Cotswold, while there is very little difference in the price. The difference in the weight of the fleeces would be, I think, about four pounds per head. A good flock of Cotswold sheep should average nine pounds of good washed wool ; I don't think a flock of Southdowns would average more than five pounds, if they would do that. In weight there is, of course, a very great difference.

LINCOLNS—LEICESTERS.

It is eight or nine years since I bred Lincolns or Leicesters. I don't think there are many pure-bred Leicesters now in the country. There are what are called Border Leicesters, which I suppose are thoroughbred, but the English Leicesters as they are bred in this country are, I think, very much mixed with Lincoln, and probably with Cotswold too. The real Leicester sheep of England is too small to be profitable or saleable in this country. I don't know that there is much difference with respect to hardiness, between the Leicesters, the Lincolns, and the Cotswolds. They are all hardy breeds of sheep, well adapted to this climate. The climate gives us an advantage with the Cotswolds, as it is conducive to a good growth of wool. They are not liable to get bare on their bellies, legs, and necks.

MANAGEMENT OF SHEEP.

The number of sheep that a farmer should keep in one flock depends on the quantity of room he has. I think there need be no limit to the number if he has room enough. I know there is an idea prevalent that Cotswolds cannot be herded together in as large flocks as the finer woolled sheep ; but I don't think there is anything in it. I have seen Cotswolds herded to the extent of four or five hundred, and as high as eight hundred in the old country, and doing well. We could keep them in this country very well on farms of from two to four hundred acres in flocks of two hundred to three hundred. I think any class of sheep, either the fine woolled or the long woolled varieties, will do better when kept in small lots than when kept in large lots.

DISEASES—HEALTHINESS OF CLIMATE.

We have never had any epidemic or contagious disease among our sheep except foot rot at one time about nine years ago. There are now no contagious diseases prevalent that I know of. I believe the foot rot was introduced into our flock by sheep from other flocks

[*Mr. Snell.*]

which we had bought. We had a slight attack of foot and mouth disease which came to us with some sheep which we imported from England in 1875. It went through our whole flock, but we did not lose any sheep by it. They were only sick for a few days and then came around again all right, and then improved in condition very rapidly. That is the only instance I ever knew of foot and mouth disease being in this country. Its symptoms are very much like those of foot rot. It affects the feet of the sheep, and they get very feverish for a few days. I think the hoofs might come off if they did not get any attention. We applied carbolic acid to the feet, and in a diluted state to the mouth. The disease went, not only through the sheep, but through all the cattle and hogs on the farm. One peculiarity was that it broke out on a neighbouring farm before it broke out on ours, although, as we supposed, it was first brought to our farm. It broke out in several places in the neighbourhood two or three miles distant. The disease seemed to travel in the atmosphere, though it might have been carried by persons visiting the farm. This is a very healthy climate, however, and there are very few diseases of any kind among our stock; even if it got a foothold I think one of our winters would destroy it. For foot rot we used bluestone powdered, which is sufficient in ordinary cases. A mixture of bluestone and verdigris ground fine is an almost sure cure.

WINTER TREATMENT—RAM LAMBS.

In the winter time we keep the sheep in open sheds, with doors that can be closed in case of stormy weather, so that they can run in and out of the yards at pleasure. We feed them in racks in the house, principally on clover hay. We feed a good deal of pea straw to our breeding ewes; to the young sheep we feed clover hay, and roots. I think from the experience I have had that to feed roots to ewes with lamb is injurious to the lambs. It makes the lambs weak. Old country shepherds say that when they have a big crop of turnips they have a poor crop of lambs. We feed them plenty of turnips after they have lambed. During the winter time we also give our young sheep a little grain—peas and oats mixed—and two or three weeks before lambing time we give the ewes a mixture of peas and oats and bran. We breed young ewes at a year and a half, to have lambs at two years old. We prefer to use rams a year old and older. As a rule, I don't think it advisable to use ram lambs. If they are used, they ought to be strong, early lambs, and be used to not more than twenty ewes. I think there would be a difference in the progeny of the sheep if they were bred to a larger number. The lambs, I think, would be smaller and weaker. I think a ram two or three years old is preferable even to a yearling.

VARIOUS BREEDS DISCUSSED.

To Mr. Malcolm.—I suppose Southdowns, being a smaller class of sheep than the Cotswolds, could be kept on less feed, though I could not say what proportion of Southdowns you could keep on the same feed as Cotswolds. I question whether you can get any higher price for the mutton of Southdowns than for that of Cotswolds in this country. I don't think buyers for the foreign market discriminate as to quality. The English butchers may discriminate between Southdowns and others, but we have to breed for the market we have.

To Mr. Wilson.—The sheep of the largest weights, I think, command the highest price in the old country. We also supply Cotswolds for the Western States—Missouri, Iowa, Illinois, as well as Kentucky.

To Mr. Malcolm.—They cross them on the Merinos and native sheep, I think.

To Mr. Balantyne.—I have never known of any cases of scab among sheep in this country.

To Mr. McMillan.—I think the pure Leicester, such as the small English Leicester, is too small for this country. The Border Lecesters are large sheep, of course.

To Mr. Whitelaw.—For early maturity, I think the Cotswolds come behind pure Lecesters in weight at a certain age. But I think we can get as heavy weight, or heavier,

[*Mr. Snell.*]

in Cotswolds at a year old than in any other breed on the same food. I do not think crosses of Leicesters would be preferred in our own markets to the Cotswolds. We get our rams at a year old, when fed for show purposes, to weigh from 150 to 250 pounds, and at eighteen months, 300, and in some cases as much as 350 pounds, and we have had rams at two and a half years to weigh 425 pounds. The Leicesters are an early maturing sheep, and so far as the quality of their mutton is concerned, are perhaps equal to the Cotswolds; though we claim that the meat is better marbled in Cotswold, a larger proportion of lean meat, but, considering mutton and wool producing qualities together, I think the Cotswolds are superior. I don't think the Oxford Downs are superior to the Leicesters, or Cotswolds, or Southdowns. It has not been long enough a standard breed to justify us in depending on it to breed with uniformity. A sheep for breeding purposes should be kept in good growing condition, but not fat. I don't give the ewes any turnips until the lambing season; nor do I feed them any grain until near lambing time. After that they are fed nearly everything they will eat. I think it is a disadvantage to have ewes fat when they are with lamb. I regard the wool of the Oxford Down as inferior to that of the Southdown. It could not be classed either as a fine wool or a combing wool. It is a dry, harsh wool.

To Mr. Gibson.—I do not consider the Lincolns superior to the Cotswolds or the Leicesters. I think you get more uniformity amongst the Cotswolds, and my experience with the Lincolns is that you don't get them of a uniform type. I went through the Lincoln flocks very extensively when I was in England in 1871, looking for fine heads and fine fleeces. There were a great many sheep with coarse heads and harsh fleeces; I don't think their wool is superior to that of the Cotswolds as a rule. Our common Canadian sheep I don't think have improved as they should have done, but I think you can attribute that to a great extent to the heavy drain that has been made on our sheep from the United States; men have often been tempted to sell their best stock. Eighteen or nineteen years ago I think we could get as good prices for rams as we can now, and Canadian farmers were better customers than they are now. I don't think that is because our present sheep are not suitable for their purposes; but I think our farmers are making a mistake in selling their sheep so closely as they are doing and often parting with their best stock. If they would keep their best stock and improve with them, there would be more good sheep in the country.

SHORTHORNS—GALLOWAYS.

To Mr. Dymond.—I have been engaged in sheep farming exclusively for about five years. My farm is 400 acres. I keep only a few Jersey cows now for butter-making purposes. There was no special reason for my changing from cattle to sheep, except that my father died and the estate had to be divided, and the Shorthorn herd was then sold. This was not done because we found the breeding of Shorthorns unprofitable.

To Mr. Whitelaw.—I have bred Galloways, but I do not think that there is any necessity for them in Canada. There are other breeds that answer the purposes a Galloway does, and answer them better. I do not consider that they would improve the common stock of the country so well as the Durhams.

SHEEP FARMING—MARKET IN THE STATES.

To Mr. Dymond.—I think sheep farming is more profitable than cattle raising, considering the direct profits from sales. I am a breeder of thoroughbred stock. The sheep I send to Kentucky are sent there for breeding purposes. I do not raise sheep so much for consumption as for breeding purposes, so that my experiment would not perhaps be the correct standard for ordinary sheep farming. It is with a view of obtaining a sheep for the United States market that I particularly recommend the Cotswold; though I think it is specially adapted for this country as well. We do not sell more than one-fourth of the number in this country that we do in the States. These sheep are purchased in the States principally, I think, in view of their value for wool, but more for nut-

[*Mr. Snell.*]



BERKSHIRES—PROPERTY OF JOHN SNELL'S SONS, EDMONTON, ONT.

ton and wool combined. If I were going in for quality of mutton alone, I suppose the Southdown sheep would be preferable to the Cotswold; but the butcher who buys for the consumer in this country I do not think shows any preference as to quality.

THE COMMON STOCK.

I do not know what the common sheep of the country are derived from. The Cotswold has been successfully used as a cross on these sheep, and during the last ten or twelve years the Cotswolds have come more into fashion. The common stock has deteriorated, because our farmers have not availed themselves of the use of pure-bred rams sufficiently. They have been too much satisfied with graded rams. One great difficulty in the way of improving the stock is that when a man buys a thoroughbred ram and breeds from him, and gets a lamb from the first cross that has all the appearance of a thoroughbred, he makes the mistake of breeding from that. There are great differences in the cost of a breeding ram. Our yearling rams can be bought from \$40 up to \$150, according to quality. By the introduction of these rams into the ordinary flocks, I think there would soon be a great improvement in the value of the stock all through the country—I am satisfied there would.

FARMERS TOO EAGER TO SELL.

There is an increased disposition in the counties in this district to keep better sheep; but I do not think there are so many good sheep in the country now as there were a few years ago, because the farmers have been selling them off too much. This is a mistake, because I do not think it is well to sell the goose that lays the golden eggs. There is this advantage in raising sheep—that you get two crops from them in the year, a crop of lambs and a crop of wool, and what you realize from the wool goes a long way to pay for the keep of the sheep. On an ordinary farm of 100 acres I think a man could profitably keep 30 sheep; and a farm of 200 acres ought to maintain from 60 to 75 or 100 sheep. That is, under a system of mixed husbandry, of course.

SHEEP MANURE—RECUPERATING THE LAND.

To Mr. Byrne.—I do not think sheep make sufficient manure to manure our summer fallows for wheat. A great deal more manure might be made from sheep by giving them more bedding, and keeping more straw under them. To use them to best advantage for improving a farm that is run down, you would have to herd them on the ground, and have them eat up green crops of rape, vetches, etc., so that they would be making mutton and manuring the farm at the same time; but I think it is better to keep cattle for the manuring of a farm, although with cattle you would have to buy more feed. The soil of my farm is principally clay. Generally, in this country, land, I think, is running down; it is not so productive as it was thirty years ago. The principal cause of the farms running down is, I think, that farmers depend too much on grain growing, and do not keep sufficient stock to make manure for the farm. If they continue the same course they are now pursuing for twenty years longer I think they will be able to produce very little grain. As the best means of bringing up a farm that is run down, I would advise the ploughing down of green crops, such as buckwheat and clover, and the keeping of as much stock as possible for the making of manure. I use salt and plaster as fertilizers, as well as manure. Leached ashes are used, but not to any extent. They are thought to be valuable as a fertilizer, but the trouble is you cannot get enough to go very far.

BERKSHIRE PIGS.

To Mr. Dryden.—The only breed of pigs that I have been raising for the last fifteen years is the Berkshire. I had some experience in breeding Suffolks and Yorkshires previous to that time. The Berkshire would be classed with the small breeds, I suppose, but they are larger than the Black Essex and other small breeds. I would call them a

[*Mr. Snell.*]

medium-sized hog. The Yorkshire is a large breed, the Suffolk and Essex small. I think a medium-sized hog is the most profitable. A small breed will perhaps get fatter at an early age—say at four or five months; but one objection to them is that they get too fat—that there is more fat than lean in them—that their meat is not marbled. At a year old the Berkshire will beat the Suffolk by nearly 100 pounds, and his meat will be more marbled—there will be a larger proportion of lean than fat. The Berkshires mature much earlier than the large breeds, and they can be fattened at almost any age. I think it is more profitable to fatten a Berkshire pig at eight months old than to keep it over the winter. At eight months old we can bring them to 200 or 225 lbs. I have been breeding, not to supply the general market, but to sell hogs for breeding purposes. At the prices we get here for pork, I do not think there is much profit in raising pigs for pork, and we cannot at all compete with the Western States in producing pork profitably. They have an immense advantage over us in their cheap corn for feeding hogs. In my opinion the best time to have pigs dropped is in March or April. Young pigs should be fed with milk, slops, and shorts. When you want to fatten them I think peas are the best feed for that purpose. In the winter season we let the breeding sows run out, and we feed them on peas. I think peas are better for breeding sows than slops. After they have pigs, we prefer to feed them slop feed, swill, and shorts. When the dam is fed on strong feed like peas, the young suckling pig is likely to have its blood heated and its legs crippled.

To Mr. Malcolm.—I think it is best to have a yard or a clover or grass field for pigs to run upon in the summer time.

To Mr. Wilson.—I do not find any difficulty in breeding Berkshires as well as others; I think they produce as large litters as any other breed. They grow to 500 pounds dressed weight at maturity. There is no distinction between small and large breeds of Berkshires, except that there are poor Berkshire hogs as well as good ones. I do not know any distinction of small Berkshires and large Berkshires; but there are a great many grade Berkshires in the country that disgrace the family, and some people get a prejudice against Berkshire hogs because they have seen some poor ones.

JOHN C. SNELL.

Sittings to take oral evidence held at Toronto, August 3, 1880. *Present*—Messrs. W. BROWN (Chairman), THOMAS STOCK, EDWARD STOCK, A. H. DYMOND, and Hon. S. C. WOOD.

MR. HUGH CLARKE'S EVIDENCE.

ALDERNEYS OR JERSEYS

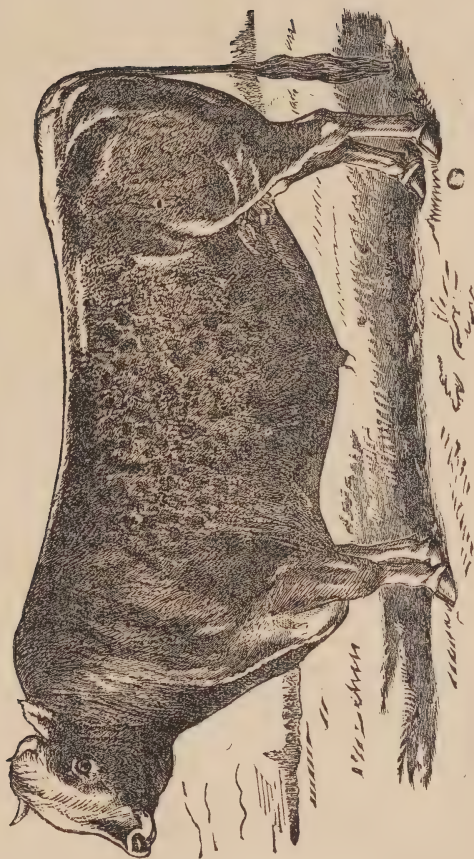
HUGH CLARKE, of Brampton, was called and examined.

To Mr. Dymond.—I carry on mixed farming in the neighbourhood of Brampton. I keep a number of cows. I have some thoroughbred animals among them, chiefly Jerseys or Alderneys. I don't think there is any distinction between the two, they are now generally called Jerseys.

THE JERSEY BREED.

To Mr. Brown.—I have kept the Jersey breed of cattle for about nine years. I imported my first stock from the United States—from Walcott & Campbell, of the New York Mills. At first I crossed them with some Shorthorns and with some native cattle. I used the Jersey bull and a Shorthorn cow. My object in trying that cross was to see if I could obtain milking quality as well as size, and I obtained some very good milkers of a fair size. One thoroughbred Jersey cow, after she had her second calf in the month of February, in six milkings gave us over eight pounds of butter.

[*Mr. Clarke.*]



JERSEY BULL.

FEED FOR MILK CATTLE.

To Mr. Edward Stock.—The kind of feed that I give cattle in the winter, for milk, is a mixture of bran, pea-meal, and good clover hay. The meal and bran should be mixed in the proportions of about one part to three. I have never tried oats.

To Mr. Brown.—I cannot say that I have noticed any particular effect on the milk from the kind of green food that is given to the cows, except rye; I think it is the worst. In the summer time, while the grass lasts, I give my cattle nothing but grass; but, about the time when the pasture begins to fail, I give them some millet, oats, and tares. I feed them exclusively on green feed in the summer, giving them no grain. I aim to have the cows calve at different times—some in the fall, and some in the winter, and some in the spring—and I try to have one or two come at a time. In winter I feed cut hay or straw or chaff, some pea-meal and bran, and roots if I have them. I make no particular effort to cultivate roots for my milk cows, but I grow a few mangolds and carrots. I have no steers, I only keep heifers, I raise my herd for butter purposes exclusively. In the summer, when the pasture gives out, I find green fodder to be valuable. I have not done anything at soiling exclusively. I have not experimented as to the effect of certain feeds on the milk.

THE JERSEY THE BEST MILKER.

I think the Jersey is the best cow to convert food into milk for butter purposes. My stock is not in high condition as regards flesh, but I find that when they are not milking they take on flesh readily, unless they are old, in which respect I suppose they are the same as other cattle. I had only one cow that failed to breed. She was an imported cow. I sold her last week for beef. She was six years old. I have done very little in-and-in breeding, but from the little experience I have had of it, I have seen no bad effects from it. I have imported bulls when I required them. We have averaged over 300 lbs. of butter in a year from our cows—that is, taking our whole herd together—some of them would be two years old, some of them aged cows, and one or two crosses of Jerseys with other cattle. The quantity obtained is from eight to twelve quarts of milk to a cow at each milking. I milk twice a day. On the average, we obtain one pound of butter from one and a-half or two gallons of milk. I have only sold one female since I got my herd. Bulls do not sell readily; females do. The only thoroughbred that I have sold I sold to a Church of England minister in Georgetown. I consider the Jerseys to be the most profitable cattle for butter making. They are hearty eaters, but I do not think they eat more than the Shorthorns in proportion to their size. They are very quiet and gentle. I have even allowed bulls two years and a-half old to run together. I like a yellow skin in a milch cow. I have not noticed anything peculiar in the odour of the milk. I have seen something of the Frenchman's milk mirror, but I have not paid any attention to it in regard to the supply of milk. I think it has gone rather farther than what is proper.

PREJUDICES AGAINST JERSEYS.

I have not taken any pains to urge the Jersey breed upon the dairymen of the Province. I don't think it is extending throughout the Province very rapidly, because, I was going to say, our Associations are trying to keep the Jerseys down. It is a rather strange thing that they should offer \$15 as a first prize for the Jerseys, and \$40 for the Shorthorns. I have not seen anything to lead me to believe that the Jerseys are in any way related to the Ayrshires. The cow which I sold last week, at six years old, weighed 1,253 pounds. She was very fat, although I did not put her up specially to feed. She was milking to within six or eight weeks of that time, and she had been milking continuously for four years. She had only one calf, and she was milked all the time from then, but the quantity of milk was small. I have the

[*Mr. Clarke.*]

heifers come in to milk at two years old if possible. I consider that the purpose of the Jersey is to produce milk and butter, and the sooner you start out with them the better, as we should not wait for size, which is not an important point. The result of crossing a Jersey bull on a Shorthorn cow was, that I got good milkers of a fair size. The milk was very rich; the cross seemed to partake of the Jersey with regard to its milking qualities, and seemed to have more of the Durham build about it. In that case the male did not impress himself so much on the make of the animal as on its milk.

JERSEY BUTTER.

To Mr. Thomas Stock.—Jersey butter is much more solid in warm weather than butter made from the milk of ordinary cows; there is less size in the pound, and it is closer and finer grained. It has a superior flavour, though some do not like the flavour, and it is richer in colour. I have yet some of the cows that I first obtained nine years ago.

To Mr. Dymond.—Before I bred Jerseys, I kept thoroughbred Shorthorns and natives. I have not tried crossing the Jersey cow with the Shorthorn bull; I think that would be going the wrong way. I would only recommend the Jerseys for those who pay special attention to butter-making—not to farmers who raise steers for beef purposes. I have imported cows as well as bulls, and all from the United States. I have paid from \$120 to \$200 for them; I paid \$120 for a bull five months old, and \$200 for a cow. When I have tried to sell bulls in this country, I could not get more than \$50 for them; I have got that much for a bull calf five or six weeks old. At present I have fifteen animals, all thoroughbreds. I do not use grades at all in my dairy. The Jerseys in some cases rapidly convey their milking properties to the common animals of the country—not in all cases; some of the bulls leave their impress much more than others. The butter in my neighbourhood is all made by hand; we have no creameries. From six cows, we have made as much as 1,800 lbs. of butter in a year. It is usually sold in Toronto. My butter has no special mark or brand upon it. I have been successful in obtaining prizes for my butter at the fairs in Toronto and London. We are now selling it at twenty cents. We take as much care of it in the making as possible. I think the flavour of Jersey butter is inherent in the animal, and is desirable; at the exhibitions no objection was raised to it on the ground of its flavour. I do not think the Jersey is so hard to feed as the Shorthorn; I think it would thrive as rapidly as the Shorthorn on the same feed. I have not used oil cake.

To Mr. Brown.—I cannot say that cows will keep up the same quantity and quality of milk on poor pasture as they will on good pasture. We hand-feed all our calves; we do not let any of them suck.

To Mr. Edward Stock.—I do not find it troublesome to milk Jersey cows on account of the smallness of their teats; the teats of the Jerseys I do not think are small—not so small as those of the Ayrshires.

JERSEY BEEF.

To Mr. Dymond.—I do not think the Shorthorns possess a greater variety of qualities than the Jerseys. I do not think they arrive at earlier maturity, and I think the quality of Jersey beef is equal to that of the Shorthorn, although there is not the same quantity, and the milk and butter are superior. I do not think it costs so much to bring a Jersey to the age of three years as the Shorthorn, because it is a smaller animal, and does not eat so much. I have had bulls which I have extra fed weigh 1,350 or 1,360 pounds at two years old. I have not sold any steers or fattened any heifers for beef.

DAIRY MANAGEMENT.

To Mr. Brown.—The cream of Jersey milk rises more quickly, I think, than that of any other. We allow the milk to sit twelve hours before skimming it. We consider that there is less labour in churning Jersey butter; there is less milk and more butter. We do

[*Mr Clarke.*]

not air the milk while it is warm in order to remove the odour. We put the milk in cans, and submerge them in ice-water, which it is claimed absorbs the odour and cools the milk at the same time, and when the cream rises it is taken off and put in a cream pail. In my experience this plan has been very successful; our butter made in this way has taken first prizes. The salt we use is Higgins' Eureka salt; it is an English salt. We tried the Goderich salt, but we did not like it; we thought that while we were using it the butter did not keep so well, and did not sell so well on the market. I know several in my neighbourhood who have stopped using the Canadian salt in order to use the English—perhaps from what they have read. I only made the one experiment of it.

COST—FEED.

To Mr. Dymond.—I cannot tell you the cost of keeping one of my cows in comparison with the produce I derive from its milk and butter. I turn my cattle out to pasture in the summer. My pasture is nothing extra. Late in the summer, when the pasture fails, I give them green feed. We generally try to have some corn, millet, vetches, and oats for that purpose.

To Mr. Brown.—We have been feeding millet lately. I consider that it increases the quantity of the cream, and that the cream is thicker from it than from other feed. The millet is headed before we begin to cut it. In churning, we use the barrel churn. We do not use any colouring. The temperature of the cream we think should be nearer 66 than 62. We only work the butter once. We use hard water. For packages, we use white oak and white ash. If oak stains the butter, I think that can be remedied by having the oak properly soaked before-hand.

HUGH CLARKE.

MR. J. W. JARDINE'S EVIDENCE.

AYRSHIRES.

J. W. JARDINE, of the firm of Jardine & Sons, Hamilton, was called and examined.

A PURE AYRSHIRE HERD.

To Mr. Thomas Stock.—I keep Ayrshire cattle principally. We have between fifty and sixty head of pure-bred animals. I have been breeding cattle for many years. My father was a breeder of cattle before I commenced the business. He has been a breeder for twenty years; before he took up with the Ayrshires, he bred Galloways. The general character of my farm is light sandy loam, with some clay loam. We claim that the Ayrshires excel every other breed of cattle in the quantity of milk they give, and that their milk contains more casein for cheese-making.

CROSSING WITH THE SHORTHORN.

I have crossed them with the native and Shorthorn cattle. In crossing an Ayrshire bull and a thoroughbred Shorthorn cow, we get a fine, large framed animal, and a good, deep milker—what I would consider a good animal for all purposes. We consider that this cross is an improvement on the Ayrshire for the shambles, and an improvement on the Shorthorn for milking qualities. We have been crossing Ayrshires and Shorthorns in that way for the last five or six years, and our experience has been very profitable. Several breeders of Shorthorns in our neighbourhood cross their cows with our Ayrshire bull.

[*Mr Jardine.*]

To Mr. Brown.—The cross of the Ayrshire bull and the Shorthorn cow has done well in regard to the quantity of milk; the richness I have not tested much. The milk is either sent to the cheese factories, sold for household use, or made into butter. The crosses of which I speak are kept partly for making butter for the Hamilton market, and partly for beef purposes. They make up well and mature rapidly, but the pure Shorthorn will produce more beef. They are fine looking and of a good, fair size, and the quality of their beef is good—they are good handlers and good feeders. The average weight of three or four year old steers would be from 1,200 to 1,500 pounds. We sold one or two that weighed as much as 1,550 pounds.

THE GRADES GOOD MILKERS

I think these grades are superior to the common Canadian cattle for dairy purposes; they make a more uniform herd of good milkers. Among the common Canadian cattle we find as good milkers as among any breed, but that is the exception and not the rule; but from crossing an Ayrshire bull on the Shorthorn or the native breeds, we get a herd of cattle which are all good milkers. I am not able to say whether the cheesy properties of a grade cow are better than those of a pure Ayrshire, but think not.

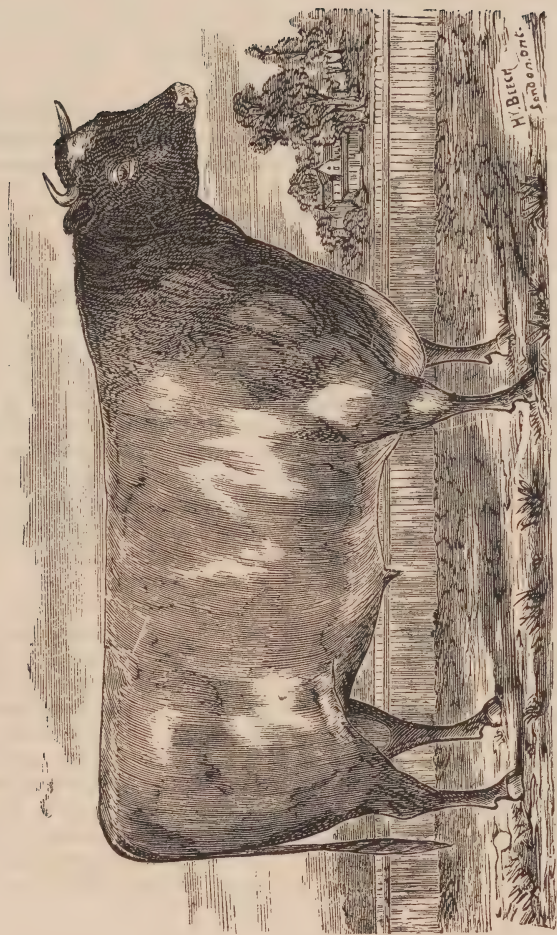
POINTS IN AN AYRSHIRE COW.

In buying an Ayrshire cow, I judge of it by beginning at the head and going back to the tail. I look for a fine muzzle, a very prominent eye, wide between the eyes, a long slender horn, a slim neck, a slim, flat shoulder, a good wide chest, but not deep, narrow shoulders, an increasing width backwards, a full flank, wide across the loins and hips, a square, roomy vessel, with the teats set well apart, and a teat to each quarter of the vessel, and a small fine tail, tapering down to the point. I place a good deal of importance on the escutcheon, which ought to be wide and run up to the pelvis. I do not think the colour of the skin has any effect on the quantity of milk, but for richness we look for a deep yellow skin. We have two or three cows which are very marked in that way, and consider their milk is a little richer in quality than that of others. I never like a short tail; I think it is an indication of coarseness. I cannot say that there is anything in the colour of the hair of the different breeds. We have our fancy colours. I do not like a light colour; I do not think light coloured animals do well in this country, as I think a light colour indicates delicacy, and greater liability to vermin. I like dark-coloured Ayrshires, with dark noses, which I think are hardier. The lighter coloured animals do not seem to stand the heat of the summer or the cold of winter so well as dark ones. I do not think a long face is necessary to a good milker, although we find some very good milkers with long faces from the eye to the muzzle. I do not like a crumpled horn; we think it is a defect in the eye, and that it is not so fine a point in the Ayrshire as a long, slender horn. The less loose skin there is on the brisket the better; I do not like any coarseness or any extra skin there at all, although this perhaps may be a fancy. But I think it indicates that the animal is flabby and weak in its constitution.

YIELD OF MILK.

I cannot give you the average quantity of milk we obtain during the whole season. We consider that we average about two and a half gallons per head per day the year round; that is ten quarts a day. We have individual animals that give from three to four gallons a day. We had one cow, which I am sorry to say we lost lately, that gave five gallons a day for eight or nine months. We lost her with milk fever a short time ago. She calved in October, and she was never allowed out in the day time, but was kept upon pea and corn meal and bran mixed, and was fed all she could eat. The calves were not with her. We milked her three times a day.

[*Mr. Jardine.*]



AYRSHIRE BULL.



MILK FEVER.

The milk fever gives us a great deal of trouble. In my time we have not lost a beast from any other cause, except one bull. The fever has always come on after calving, with one exception; that was a cow which took sick a few hours before she calved, and showed symptoms of milk fever. The disease is considered to be incurable. We have one cow which lost the use of one leg from the fever, but she is still breeding; we had another that recovered for a time, but went off on the third day. There are two kinds of milk fever. One is a sort of inflammation of the womb—a parturition fever; another is inflammation owing to the rapid change from blood to milk. I have gone so far as to give them medicine before calving, and they still had the milk fever. Any that we have lost we have milked before calving. I think a dose of stimulants after calving is a good thing. None but good milkers take milk fever.

To Mr. Edward Stock.—I have not tried brewers' yeast; I have always looked upon that as an old woman's cure, and consider we have better medicines in use.

INFLUENCE OF FOOD ON MILK.

To Mr. Brown.—I could not give the proportions of the cheese and milk in our herd. I think the food of cattle has some effect on the milk, but not so much as a great many suppose. There are some animals that will not give good milk even though you may feed them the richest food, while others will give milk of a rich quality on almost the poorest food. I have known cattle that were almost starved in our neighbourhood, and the party who sold the milk in the city told me that he did not see any difference in the quality of the milk, although it was diminished in quantity.

To Mr. Thomas Stock.—There is a great difference in the quality of the milk from different animals; in my herd, where the cattle have always been treated in the same way, I find a great difference in the quality of the milk. It is the machine, I think, more than the feed, which influences the quality of the milk; but you can get any flavour you like by the feed.

SUMMER FEEDING.

To Mr. Brown.—In the summer time I maintain my herd on grass, and always soil them for from two to three months. I commence soiling very early. I sow rye in the fall and cut it as early as the 10th of May. I commence with rye; the next green fodder is peas and oats, which I find the best of all; and then corn, which is sown at different times and lasts till the fall. I have tried vetches and lucerne, but they did not do well with me. I certainly prefer soiling to grazing, so far as the quantity of milk produced is concerned; but still I must have a run for the cattle. You cannot keep up the quantity of the milk so well on pasture as you can on green fodder. I find less difficulty in keeping up the standard of the milk in winter, for that reason, than I do in summer. At the present time I am soiling.

WINTER FEEDING.

In the winter I commence on roots and cut feed, and I steam everything together. I put in my roots, and bran, and cut corn-stalks, and chopped stuff, and steam them all together. I feed very little hay. I have an agricultural steamer which came from Rochester, and it will steam from twenty to forty bushels at a time. I find that the cattle do better on the steamed feed, because once or twice when I did not use the steamer they fell off in their milk. I only feed a little uncut hay in the evenings after the regular feedings. I cut up all my straw and corn-stalks. The roots I feed are mangolds and turnips; I think they are good for dairy purposes, but I prefer the mangolds. I have never had a case of abortion in the Ayrshire herd; I have never known a case to occur among our cattle since we had the Galloways.

[*Mr. Jardine.*]

MARKET FOR SURPLUS STOCK.

We have always had a ready sale for our surplus stock; we have never had to keep an animal for sale over two years. We have sold a great many in the United States. We make a rule and seldom sell anything under \$100, and we get from that to \$200. Once or twice we got a little more for older animals. This year we sold a first prize two-year-old heifer to an American for \$400—one that took the first prizes at Toronto and Ottawa last year. But our average price is from \$100 to \$200. We sell them principally for the dairying districts. We sell a good many around Ingersoll and throughout the county of Oxford. All whom we have heard from have been well pleased with what they got from us. The bulls we sell are used generally on grade cows. I have not tried the Shorthorn bulls on the Ayrshire cows; but I had an accident of that kind that turned out very well. It was a heifer that was a very good animal, and could hardly be detected from a Shorthorn. A shipper offered me five cents a pound for her, and my own judgment and that of the butchers around there was that she would go 1,600 pounds, and thinking her with calf I did not feed her specially for the butcher. But for milk I think you should use the Ayrshire bull with the Shorthorn cow.

IN-BREEDING.

To Mr. Dymond.—I have had some experience in in-and-in breeding. I have found no prejudicial results from that practice, but the animals perhaps look a little delicate. Some of the animals which have been the most successful in the prize-ring have been a little in-bred; but I would not approve of in-breeding promiscuously. I have gone as close as the sire and the daughter. The result was not prejudicial. They were both very fine animals and of the same type, and the progeny was equal to either of them. I like to import fresh stock every few years—fresh bulls. I find it best to procure them direct from Great Britain.

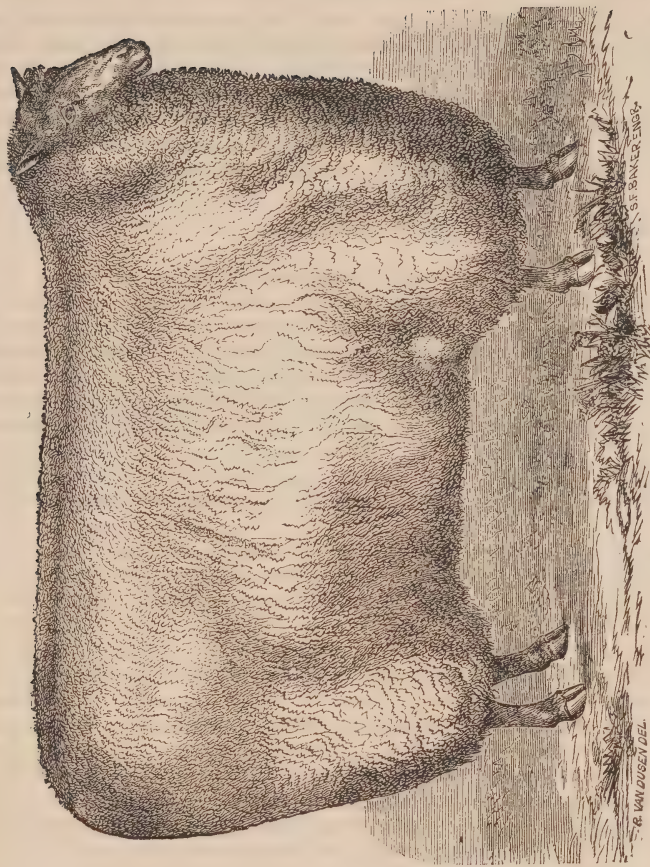
NATIVE CATTLE—THE AYRSHIRE'S HARDINESS—THE SHORTHORN.

I cannot say that the common stock of the country has the Ayrshire type more prominently than any other. I think our natives come nearer to the Ayrshires in their milking qualities, but not in appearance. I cannot say to what class the native stock belong; it may be they go back to the Holstein cattle. In point of hardiness I think the Ayrshire is equal to the Shorthorn. In point of feeding I think it will live where the Shorthorn will starve; that is my experience of both breeds. The Shorthorn is the more dainty feeder, but it has more capacity than the Ayrshire, and I don't know but that under the same circumstances it would improve faster. Considering milk and beef together, I would recommend ordinary farmers, for general purposes, to substitute Ayrshires for Shorthorns. I think our native cattle, improved by Shorthorns, would perhaps be better for milk and beef combined than they would be if improved by the Ayrshires, especially for beef. I am aware that some families of Shorthorns give good quantities of milk, and there are some families of Ayrshires that give less milk than others. We do not, as a rule, raise much stock from the poor milkers; we have never had any very poor milkers.

NO FATAL DISEASES EXCEPT MILK FEVER.

We have never had any other diseases among our cattle, besides the milk fever, that proved fatal. We had the foot and mouth disease in our herd two or three years ago, but we kept it very quiet at the time until we got over it. We considered that we got it from the Western States, owing to having had our cattle in cars where Western cattle had been. It broke out in so short a time after the cattle came off the cars that we were satisfied that that was the cause. We cured the cattle that were affected, and had no deaths from it. We did not allow it to get through the herd, because we separated all the affected

[*Mr. Jardine.*]



COTSWOLD RAM.

R. VAN DUSEN DEL.

SF. BAKER ENG.

cattle from the others. We had an old country surgeon to examine them, and as soon as the disease was detected they were taken to the hospital, and it was completely eradicated. So far as Canada is concerned we have been completely free from epidemics. We have lost more from the milk fevers in some years than in others, but I don't think it is more liable at one time than at another, except July and August. I do not think there is anything peculiar to it in the climate or the season. I have not experienced any injurious effects from feeding rye; I never feed it after it comes to maturity, and when there might be some danger from it.

EXPERIENCE OF GALLOWAYS.

We had a herd of Galloways at one time. We did not retain any of them; they did not excel in anything particular, although they are hardy, and, if allowed to run, will do better than any other cattle. They can be domesticated very well. For a large herd and a large tract of land, I have still the opinion that the Galloways would be one of the best class of cattle. They are good feeders, but of course you do not get the amount of beef from them that you do from the Durhams, and they are not as good milkers as the Shorthorns or any other breed that I am acquainted with. I think the demand for Ayrshire bulls from the cheese factory districts is improving; I have in no case heard of the Shorthorn being substituted for them for dairy purposes.

DECREASE IN SIZE.

To Mr. Brown.—The Ayrshire that we have now is, I think, smaller than the old stamp of the Ayrshire was. I believe that is the case in the old country as well as here. I believe they are breeding them finer there without any regard to the size, and so long as they retain their milking qualities I don't think that will be any injury to them. We have one or two of the old stamp of Ayrshires that will weigh about 1,400 pounds. They are harder to keep, but I don't think they are any better milkers than the smaller ones. I could not give an average of what it costs per day per animal to keep my herd, but am positive that it costs much less to keep thoroughbred Ayrshires than common or native cattle.

J. W. JARDINE.

MR. JAMES RUSSELL'S EVIDENCE.

SHORTHORNS—COTSWOLDS.

JAMES RUSSELL, of Richmond Hill, was called and examined.

To Mr. Brown.—I have been breeding Shorthorn cattle for about fifteen years along with my brothers. The farm is principally a heavy clay loam of 450 acres, nearly all in the township of Markham. We keep about 35 head of pure-bred cattle, and 130 Cotswold sheep. Our plan has been to raise full-bred cattle and sheep for the American market for breeding purposes. We raise about 200 acres of grain annually, and sell from 5 to 100 tons of hay.

WINTER FEEDING.

To Mr. Thomas Stock.—In winter we feed hay, turnips, mangolds, and a little meal to the cattle. We slice the roots for calves, but generally feed them whole to one-year-olds and over. In the summer season we feed almost entirely on grass in the field. We do not now raise any other breed of cattle than Durhams.

[*Mr. Russell.*]

DURHAMS AND AYRSHIRES.

We have had a few Ayrshires, but find them to be hard feeders. It is not claimed for the Durhams that they excel for dairy purposes. I believe that a cross between a common grade cow and a Shorthorn bull will produce a cow that will sell for more money than an Ayrshire in the Toronto market.

ORIGIN OF HERD OF DURHAMS.

Our cattle are imported from the herd of Mr. Sylvester Campbell, of Aberdeenshire, Scotland, or bred from them, and have been successful competitors on the best show grounds of Canada and the United States. They have been bred down from what were prize winners more than fifty years ago. We do not feed many for the butcher. We fed five head last year, two cows and three heifers. They sold in Toronto at 6½ cents per lb. live weight, and were sent to England.

IMPROVEMENT OF CATTLE.

To Mr. Brown.—The late importations of cattle have been of finer quality, and from the use of pure-bred bulls some farmers in this section are selling fat cattle at \$100 per head, who ten years ago seldom realized one-half that amount.

SALES TO UNITED STATES—BOOTH v. BATES.

To Mr. Stock.—My sales of cattle have been mostly to parties in the United States. Prices for heifers from \$250 to \$400 each; bulls from \$100 to \$300 each. I prefer the Booth cattle to the Bates, and consider they have better constitutions and are better feeders.

MIXED PEDIGREE BEST.

Though I am of opinion that some of the principal Shorthorn cattle breeders in Britain are correct in stating that after paying high prices for line bred bulls they have nearly ruined their herds with them, and are now using bulls of mixed pedigree, I am satisfied that a line bred bull is not superior to a bull of mixed pedigree as a stock-getter without he is superior both in form and quality.

NO STEAM FEED.

We do not use steamed feed for cattle, and would not use a bull out of a herd where this system is followed, if aware of it. We have raised fifteen calves this season, and have only lost one in ten years by cows slipping their calves. I approve of high feeding on substantial food, but not of oil cake for breeding stock.

PRIZES FOR STOCK—HIGH FEEDING.

My first prize cows were at the Centennial show in Philadelphia, in 1876. One of them was first at the Ontario Provincial Show in 1878. She is now carrying her eighth calf at nine years old. She is called by many the fattest and by far the heaviest cow in a ring of eighteen, most of them imported from England and Kentucky. The other one has had six calves at seven years old. She is the dam of the first prize two-year-old heifer at the same show. That is ample proof that high feeding is not detrimental to breeding stock. I am of opinion that roans and whites are the best feeders, though the American demand is mostly for red colours.

[*Mr. Russell.*]

THE CANADIAN HERD BOOK.

I register all in the Canadian Herd Book, and believe it to be more reliable than the American. My pedigrees run from eight to sixteen crosses. I think no one would be injured by raising the standard of registry to seven crosses, as there is more money in feeding cattle with four or five crosses for the English market than in selling for breeding purposes.

DEMAND FOR COTSWOLDS IN THE STATES.

To Mr. Brown.—I have been breeding Cotswolds since they first came into Canada, and have taken prizes at the principal shows in Canada for Leicesters, Lincolns, and Cotswolds—but a few years ago I sold off all but the Cotswolds, finding they had better constitutions, and were the most profitable. My principal market is in the United States. Last year I sent fifty to the States. In 1875 I sold all my yearling rams, eight of them at an average of \$105 a head. Have sold ewes of my own raising at \$300 per pair.

INJURY TO THE COTSWOLD BREEDERS.

There is no doubt but it is an injury to the sheep trade, the lowering of the Cotswold prize list, by the Board of Agriculture, and raising the Downs. Another circumstance which injures the Cotswold breeders is the fact of shippers advising farmers to cross their flocks with Downs, because they have more profit in handling them; and the wool dealers have had more profit lately in fine wools, and for this reason complain of the coarse wool of the Cotswold. While the Cotswold has the name of producing all the coarse wool, the fact is, that there is not 5,000 lbs. of pure-bred Cotswold wool (Canadian,) sold in Toronto annually. The coarse wool comes principally from the Lincoln cross. I am not prejudiced against any breed of sheep, but will be guided by the American demand what kind to raise.

COTSWOLD CROSS ON THE MERINO.

Should the demand increase for Downs, it will not lessen the principal demand for Cotswolds, as there is no cross equal to the Cotswold cross on the Merino, to produce combing wool.

COTSWOLD INFERIOR TO DOWNS FOR MUTTON AND WOOL.

I have made up Southdowns, for show purposes, and consider that the Cotswold will produce more value in wool and mutton, on the same amount of feed, than any other breed, if properly bred.

GOOD FEEDING REQUISITE.

The reason that Southdown mutton gives better satisfaction to the butcher is owing to the fact that more than half of the sheep killed in the country are not half fed, and large Cotswold sheep require to be well fed to make a good quality of mutton. I fed 130 one season and killed and sold them by the carcass on the Toronto market at eight or nine cents per lb, some of them Southdowns, some Cotswold, and part of them Leicester. I found the best butchers in Toronto could not select out the Downs. The Cotswold mutton is better mixed with lean, than the Leicester or Lincoln. I believe it to be a mistake to cross good grade flocks of long-wooled sheep with Downs, as there is more profit in selling lambs young than in raising sheep for the British market at present prices, and Southdown wool must advance in value before it will pay to make the change.

[*Mr. Russell.*]

SALE OF LAMBS PROFITABLE.

To Mr. Dymond.—Selling lambs to the butcher, at four and five dollars per head, pays better than keeping them till eighteen months old and selling at five and five and a half cents per lb. live weight, for shipping purposes.

HEAVY COTSWOLD LAMBS.

My heaviest Cotswold lambs weigh on the first of September, 175lbs. Heaviest breeding ewes, 325 to 350lbs. each.

DEMAND GREATER THAN SUPPLY.

There being a good demand for Cotswolds from Maine to Colorado, I am confident that one-fourth part of the American demand can not be supplied in Canada the present season.

COTSWOLD BREEDING IN THE STATES.

A number of Cotswold breeders have been springing up in various parts of the United States, but judging from their success, I am of opinion that the best stock rams for the American continent will be raised along the north shore of Lake Ontario. I do not believe that there is as suitable a soil and climate south of the lake. I do not think the Leicester wool has more lustre than the Cotswold. Of course Cotswold breeders could very soon improve the quality of their fleeces, but the American trade principally demands weight of fleece more than quality, and the profit to the breeder is to raise what is wanted.

WINTER FEED.

In the winter I feed pea straw, hay, and turnips, to sheep. Good shelter from the cold winds is of great benefit, at the same time they require an outside yard, to be healthy.

SUCCESSFUL COMPETITION AT EXHIBITIONS.

Since giving the above evidence, I have been awarded the Silver Medal, for the best pair of fat sheep for exportation purposes, competing with Cotswolds against all other breeds; also five out of seven first prizes at the Toronto Industrial Exhibition for Cotswolds; and six out of eight first prizes for Cotswold sheep, including flock prizes, imported and Canadian bred.

JAMES RUSSELL.

MR. JAMES LAWRIE'S EVIDENCE.

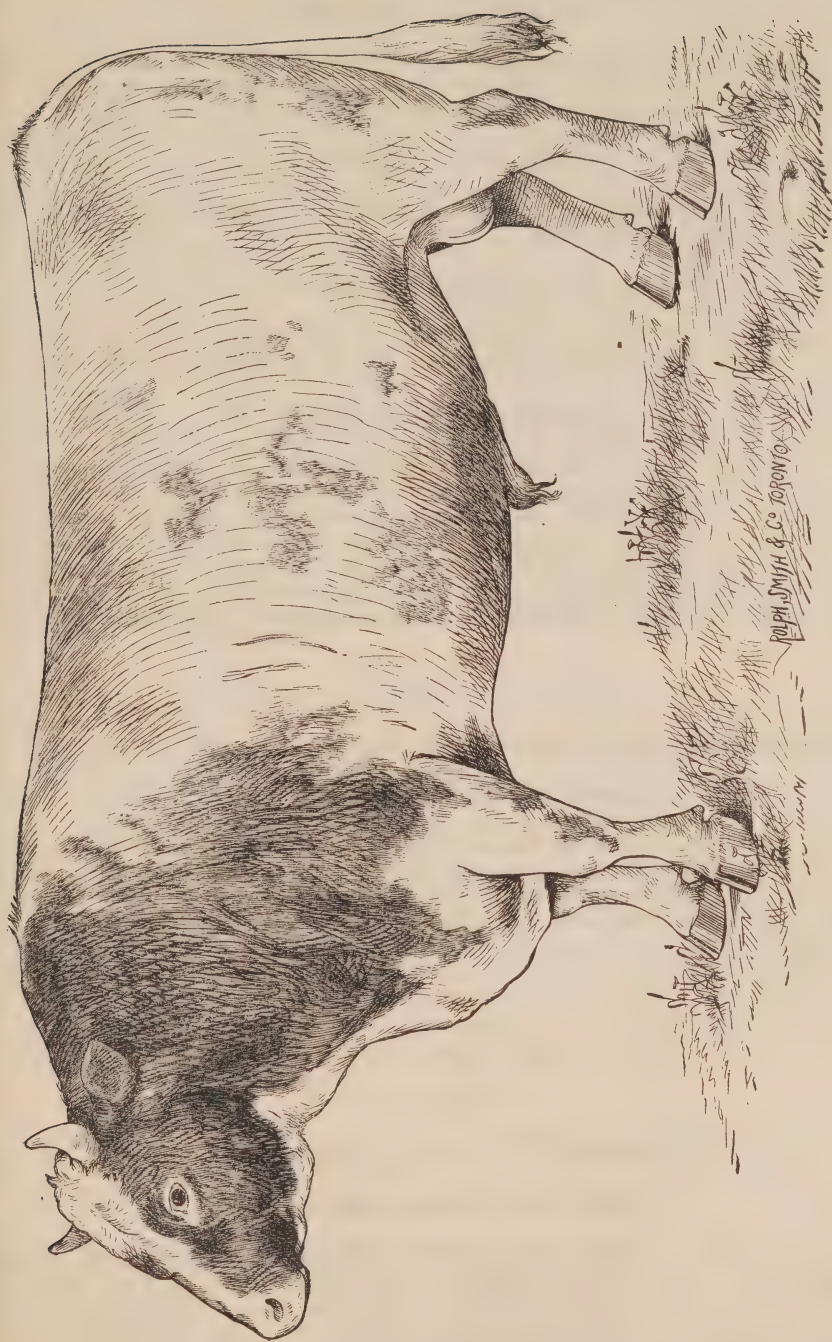
AYRSHIRES.

JAMES LAWRIE, of Malvern P.O., Township of Scarborough, was called and examined.

PURE-BRED AYRSHIRES—IMPORTATIONS.

To Mr. Dymond.—I have been carrying on farming in the township of Scarborough for about thirty years. I originally came from Scotland. I am engaged in mixed farming—raising horses, cattle, sheep, and grain crops. My farm is about 300 acres. I have about forty pure-bred Ayrshire cattle, and I keep nothing at present but pure-bred Ayrshires. I kept Durhams at one time, but they were very high-priced, and if one died, the loss was very great. The risk in keeping Durhams was greater, and I

[*Mr. Lawrie.*]



AYRSHIRE BULL, "SIR WALTER."

went into the keeping of Ayrshires, because they were easier to keep, and sold well. The first Ayrshires I kept I purchased from Mr. Simon Beattie, who brought them out from Scotland. Since then I have gone to Scotland myself and brought out a number. I cannot say that the Ayrshire is a more profitable breed for this country than the Short-horn; but you do not require so much capital for them. I can sell a good cow now for about \$100, and a two or three-year old bull for about the same price. We find a market for nearly all our surplus stock. We generally sell some to the butchers. We hardly ever raise any steers for the English market; but last Fall I sold a very fine bull to go to Europe for \$100. I think it weighed 1,400 or 1,500 pounds, live weight. I have used the Ayrshires for improving the common stock of the country; our bull is used on the neighbours' cows all the time, and I have seen some very fine specimens of the crosses produced by him. I do not do much dairying. We try to get our calves brought into good condition, and we feed nearly all the milk we have to them; what we have left we make into butter and bring it into Toronto. Our first object is stock raising. I have never practised in-breeding; I have always had a fresh importation every two or three years. I chiefly esteem the Ayrshires for their milking qualities. I would not recommend them as superior to others for beef. I certainly think the Durhams are ahead of all others for beef. I have never fed any steers for market; but I have fed several young cows, and have got them to weigh 1,400 to 1,500 pounds at three years old. I don't think there is much difference in the cost of feeding Ayrshires and Durhams, and I don't think buyers would have any preference between the two. The man who bought my Ayrshire bull last year seemed to prefer it to the Durham. I think the Ayrshires are finer and smaller-boned than the Durhams.

To Mr. Brown.—I pasture a good part of my farm. My land is a heavy clay. I have been in Ayrshire, Scotland, and I know that the Ayrshiremen put a good deal of their land under pasture. I purchased mostly in the neighbourhoods of Glasgow, Hamilton, Stonehouse, and thereabouts.

POINTS IN AN AYRSHIRE—BLACK NOSES.

I have been at several Ayrshire shows. I found that the ideas in choosing Ayrshires had greatly changed when I last went home. When I was younger, we selected an Ayrshire with a fine long muzzle and a long horn; but I found when I went back that they wanted a shorter face and a shorter horn, which, they said, indicated a stronger constitution. They also wanted an animal well wedged in the flesh and getting wider backwards, with the bag well up, and the milk veins shown very prominently. They have the fashion of saying there that when the bag gets low it indicates that the cow has lost her grip. I think an Ayrshire ought to show a good escutcheon. I like a yellow skin. The favourite colour in Scotland is mottled red and white; but I don't think there is anything in the colour more than that it shows breeding from good stock. I do not agree with Mr. Jardine in favouring black noses. I detest them, and they would not be tolerated in my part of the country. I have not one black nose in my whole herd.

PASTURING IN SUMMER.

In the summer time I give my cattle very little besides what they get in the fields; but I try to keep my pasture in good order. As the show time approaches, however, we treat them a little better. In winter we give them all the hay they will eat, as well as turnips and pea meal, a little corn, and vetches. We do not follow the soiling system. I do not know but that would pay as well as pasture, but I have good pasture, and I like to let them run. The only kinds of grass I have yet sown are timothy and clover. There is a small quantity of bush in connection with the pasture, which is very beneficial to the cattle in the hot weather. I can keep my cattle perfectly well on the pasture all the summer round, better than the Canadian cattle; but care must be exercised not to overstock the pasture or to put more on it than it will bear.

[Mr. Lawrie.]

MILK FEVER—HIGH CONDITION.

I have been troubled very much with milk fever. Last year I lost five of my best cows from it. I attribute it to keeping the animals in too high condition about breeding time. We sometimes try to keep a few of our animals in fine condition for the shows, but when they happen to breed about that time they are sure to get milk fever. I think breeding cows ought to be put in and milked for a week before they calve. I think that is the only effectual precaution against milk fever. We generally let the calves suck the cow for four or five days, and take care that she is pretty well milked and that there are no teats undrawn. Then we tie up the calves, milk the cow, and feed the calves by hand, giving them milk for four or five weeks. We then turn them out on the fodder, giving them also a little milk and pea meal. We feed most of our milk to the calves, but with the remainder we make butter and a little cheese for the Toronto market.

YIELD OF MILK.

I could not give the proportion of milk necessary to produce a certain quantity of butter; but I sold a cow once to a man in the States, who wrote back to me that the cow had given seventeen pounds of butter a week. He bought her and took her away about the month of June. I cannot tell you the quantity of milk per head that they give each day; but when in good condition, each cow will fill a patent pail, morning and evening. That, I suppose, would be twenty-four quarts per day; but that does not last all the year round. They begin to fail in the latter part of the year, about October. We generally let them go dry in November or the beginning of December. Some of them get dry earlier than others, but we generally try to get them dry a little while before calving. We bring in the cows as nearly as possible about the same time.

DEMAND FOR AYRSHIRES.

To Mr. Dymond.—There is very nearly one hundred acres of the three hundred acres in pasture. I have about forty animals in my herd. There is a pretty good demand in this country for my cattle. I sold two to the butcher last year. I used to find some demand in Nova Scotia, and I have sold some in the west, and north towards Lake Simcoe. When I say West, I mean in the neighbourhood of London; I sold two for the Lunatic Asylum at London, as well as several for the cheese factories in that district. I do not find a very great demand in the United States; I think I have sold one or two for the States. My neighbours have manifested a disposition to use my Ayrshire bulls for crossing on the native stock, and I have seen some beautiful animals obtained in that way. But a great many are using poor native bulls; they would rather take a poor scrub than pay \$2 for a good bull. I generally charge \$2 for the use of my bulls. There are a good many graded bulls in use, crosses of my thoroughbreds on the native stock, and the farmers can get the use of some of them for 50 cents.

To Mr. Brown.—I think I can make more with Ayrshires on my farm than I could with Durhams. In raising Durhams, I found that unless I could get a good race of Durhams I could not compete with Miller and Cochrane and others, and in order to do that one must have a large amount of capital. Consequently, I went into the Ayrshires, and do not require so much capital.

BUTTER MAKING.

To Mr. Dymond.—I do not send any milk into Toronto, only butter. We used to bring in 100 pounds a week, but the quantity depends on the condition of the calves. Taking the whole year round, I think we bring in over 50 pounds a week. There are no creameries in our neighbourhood; the butter is made in the cellar. There are two or three cheese factories in the neighbourhood. I have not tried the whey from the cheese factories for the calves; we use the refuse milk for the pigs, and give the calves new milk.

[*Mr. Lawrie.*]

We get as much as 22 and 25 cents for the butter we sell; the price goes up and down according to the market; sometimes we sell for as low as 18 cents. There is no doubt in my mind that the nature of the feed given to cows has an effect on the quality as well as the quantity of the milk. In the winter time, when I am feeding hay and turnips to the cattle, and not meal, the quality of the milk deteriorates; but I find that when I give them pea meal and hay it improves. If you give cattle plenty of pea meal it will take away the flavour of turnips from the butter; we have never had much trouble with turnips so long as we use pea meal. The salt I use is fine bag salt—I think Canadian refined.

To Mr. Brown.—I do not think it is possible to destroy the symmetry of the Ayrshire by fine feeding. If you let them suck the cow too long I think they get coarse on the horn and all over. It makes them strong in the horn, thick-necked and bull-like.

COTSWOLD SHEEP.

To Mr. Dymond.—The sheep I am keeping are nearly full-bred Cotswolds. I agree with the evidence given by Mr. Russell on that subject. I used to keep Leicesters, but I latterly crossed them with the Cotswold rams, until I think they have become merged into the Cotswolds altogether. I think the Leicesters are a little finer than the Cotswolds, although I like them as well. I never kept the Southdown at all.

CLYDESDALE HORSES.

To Mr. Thomas Stock.—I raise pure Clydesdale horses, chiefly for sale. I have at present a couple of mares and a couple of stallions that I brought out from Scotland. I think the Clydesdale stallion on the Canadian mare is the best cross you can get.

To Mr. Dymond.—My object in crossing the Clydesdale on the Canadian stock is to raise a general purpose horse. The lighter horses may be more suitable for certain purposes and where long journeys are necessary, but I think a farmer who keeps two or three span of horses should keep a span of Clydesdales and a span of light ones. We never find the Clydesdales too heavy for the market, and the pure heavy Clydesdale horses sell for more than any others. I raise about four horses every year. They are mostly of the same type, got by a thoroughbred Clydesdale stallion, and from as heavy mares as I can get. I go in for the heaviest make I can find. I usually sell my horses in Toronto; the Americans come here to buy them all the time, and, I think, take them to New York. We find them equally saleable for the plough as we do for dray horses for the city. They do very well when crossed with light mares. There is a demand for light horses also; in fact, there is good demand for any kind of good, sound, young horses. I have not sent any to England. For a good draught horse I have frequently got as much as \$200 at three years old. Such a horse would weigh 1,300 or 1,400.

To Mr. Edward Stock.—The Clydesdales are bred here more numerous than any other class of horses.

To Mr. Thomas Stock.—I think the produce of imported stock is as large as the imported stock itself. I do not think there is anything in the Canadian climate that reduces their size.

THE PERCHERONS.

To Mr. Dymond.—I have not tried any other breed of horses particularly. I have tried the blood mare with the heavy draught horse, and got a good general purpose horse, full of life, strong and vigorous. I have not gone into breeding carriage horses or roadsters. I have seen the French Percherons in Montreal and in Toronto, but I do not like them. Mr. Beattie had one. Four or five years ago I was called on as a judge in Montreal, and I was judge of six of them, but I did not like them very well. They had fine bodies and seemed to have life enough in them, but I thought they had not bone and sinew enough in them to carry their carcass. I have not met anybody who has used them. If

[*Mr. Lawrie.*]

a horse has not good legs I think it is of no use. I would not depend on using the Percherons for the improvement of the common stock of the country as I would the Clydesdales. I do not think it would improve them to cross them with some other pure-bred stock. Some of the Clydes are pretty heavy about the head, but as a rule you can find many of them pretty fine in the head and well set upon their pins.

JAMES LAWRIE.

Sitting to take oral evidence, held at Almonte, October 13th, 1880. *Present—* Messrs. E. BYRNE (Chairman), and A. H. DYMOND.

MR. JOSEPH YUILL'S EVIDENCE.

JOSEPH YUILL, of the Township of Ramsay, called and examined.

I am a farmer and stock raiser, owning 200 acres, of which about 160 acres are cleared. I have heard the evidence of Messrs. Black and Cochrane, and agree generally with them as to grain growing.

ROTATION DISTURBED BY GRASSHOPPERS.

My rotation is about the same as theirs, but it has been disturbed by the ravages of grasshoppers on the grass lands. This year one of my neighbours lost all his wheat by this cause. They are still very numerous.

PURE-BRED AYRSHIRES.

I devote my attention largely to thoroughbred stock of the Ayrshire breed. I have been breeding them for twelve years. I have bred no others. For dairy cattle I prefer them to all others. If the Ayrshire does not bring as much for beef, it costs less in proportion to feed them than the Durham.

POLLED ANGUS OR GALLOWAYS FOR BEEFING.

If going into cattle feeding for market I would prefer the Galloways or Polled Angus. They are thriftier animals for our bare pastures in summer and hardier in winter. If they have to look for their feed themselves they will do best, but for feeding altogether in stalls I would consider nothing better than the Durham. I used a Galloway bull one summer, but was persuaded he would not suit, and so sold him. Stock got by him were poor dairy cattle, but grew a great size. I then went into Ayrshires, and have about thirty, as well as a few well-bred grades. They vary as milkers.

DAIRY FARMING.

We have a small private creamery and make our own butter. I have no figures with me for this year. Last year butter and cheese were very low. The year before we made over \$300 off twelve cows, besides all the butter used by a family of fourteen persons, and raising eight calves; this year we shall do a little better. In the year before last we sent five cows' milk to the cheese factory, and made the rest into butter.

AVERAGE BUTTER PER COW.

Some of the stock are young, but two hundred pounds of butter would be a fair season's average to a cow. I can send the amount realized for this year afterwards.

[*Mr. Yuill.*]

AN "EVANS" CREAMERY.

Our creamery is calculated for fifteen cows. It is known as "Evans'" creamery, and consists of five cans costing \$25. They are about two feet high, of seven or eight inches diameter, and in two parts, connected by a narrow neck with a stopper in it. The lower portion will hold about fifteen quarts and the upper five quarts. The cream is supposed to fill the upper part of the vessel; the stopper is inserted, and the upper part of the vessel can then be easily removed.

TREATMENT OF MILK.

The milk vessels are immersed in cold spring or iced water for twelve hours, until the cream has risen. The cream is then put into another vessel to ripen for about thirty six hours, and then churned by a dog-power in an old-fashioned churn. We get twenty one cents per pound for the butter. We use an ounce of salt to the pound of butter, and a little saltpetre. We always use the ground Liverpool salt.

AYRSHIRES AS MILKERS.

I should say that, as against the native stock, the Ayrshires would be better for milk by one-third. The skim milk is very good for raising calves.

A PRIZE BULL.

I am now breeding from the Ayrshire bull that took the gold medal at the Centennial, at Philadelphia. It cost \$300 delivered here. The services of the bull are pretty fairly sought after by other farmers in the neighbourhood.

SALES OF AyrSHIRES.—PRICE OF CALVES.

I sell a good many thoroughbred Ayrshires. I shipped two to Manitoba lately. There is a good demand in the country. I got \$100 each for those I sent to Manitoba, a bull calf and two-year-old heifer. We raise all our pure-bred calves, seven or eight every year. I get from \$50 to \$100 for a bull or heifer calf in the fall of their first year. We get at least \$25 for a young calf in the spring.

PURE LEICESTER SHEEP.

I have been raising pure Leicester sheep for twelve years, generally wintering about thirty-five, but am now crossing them with the Lincoln as they were getting too fine in the wool and small in the body. I sell them for breeding purposes to neighbours. I can sell all I raise.

BERKSHIRE HOGS.

I also raise pure Berkshire hogs. I never cross them, and get a fresh boar every year to avoid in-breeding.

JOSEPH YUILL

The witness has since forwarded the following statement:—

BUTTER ACCOUNT FOR 1880.

Sold in small lots up to—

June	15—493lbs.	of Butter, at 20c	.....	\$ 98.60.
July	6—265lbs.	" at 16c	.....	42.40.
August	23—319lbs.	" at 20c	.....	63.80.
October	2—175lbs.	" at 21c	.....	36.75.
"	13—54lbs.	" at 21c	.....	11.34.
"	23—140lbs.	" at 21c	.....	29.40.

1446lbs.

\$282.29

This is the amount and value of butter sold, besides supplying eleven of a family with butter and milk.

[Mr. Yuill.]

JOSEPH YUILL.

Sitting to take oral evidence, held at Cobourg, October 19, 1880. *Present*—Messrs. AYLSWORTH (Chairman) and DYMOND.

MR. DOUGLASS' EVIDENCE.

DONALD DOUGLASS, of Percy Township, was called and examined.

He said: I have a farm of 400 acres, and devote my time principally to cattle and sheep. I have been engaged in dairying of late, and have reduced my flock of sheep to about forty.

COTSWOLDS AND LEICESTERS.

My sheep are thoroughbred Cotswolds and Leicesters, and those I do not use for breeding are exported.

MARKETS FOR SHEEP AND LAMBS—PRICES—WEIGHT.

Shearlings and lambs are sent to the American market, and ewes that have ceased breeding to the English market. Shearlings sell at from \$35 to \$50. Leicesters are now more in demand amongst Americans than formerly. Sheep for shipment to England sell at about \$10 each; they weigh from 250 to 300 pounds.

CLIP OF WOOL.

I generally get a clip of ten pounds washed wool from Leicesters or Cotswolds, though I have a Cotswold ewe which sometimes gives sixteen pounds. The Cotswolds give a little more wool than the Leicesters, and we get about the same price for the wools. The Leicesters of my flock are the Border or large Leicester breed.

SHORTHORNS AND AYRSHIRES.

I keep about fifty head of horned cattle, some young stock, and about thirty milch cows. I have some thoroughbred Shorthorns, but my cattle are largely Ayrshire, which I favour on account of their milking qualities. I have from sixteen to eighteen fine Ayrshires.

THE DURHAMS AS MILKERS.

The Booth Durhams are generally good milkers, but the quantity shrinks as the season advances, cattle of that breed being very sensitive to the climate.

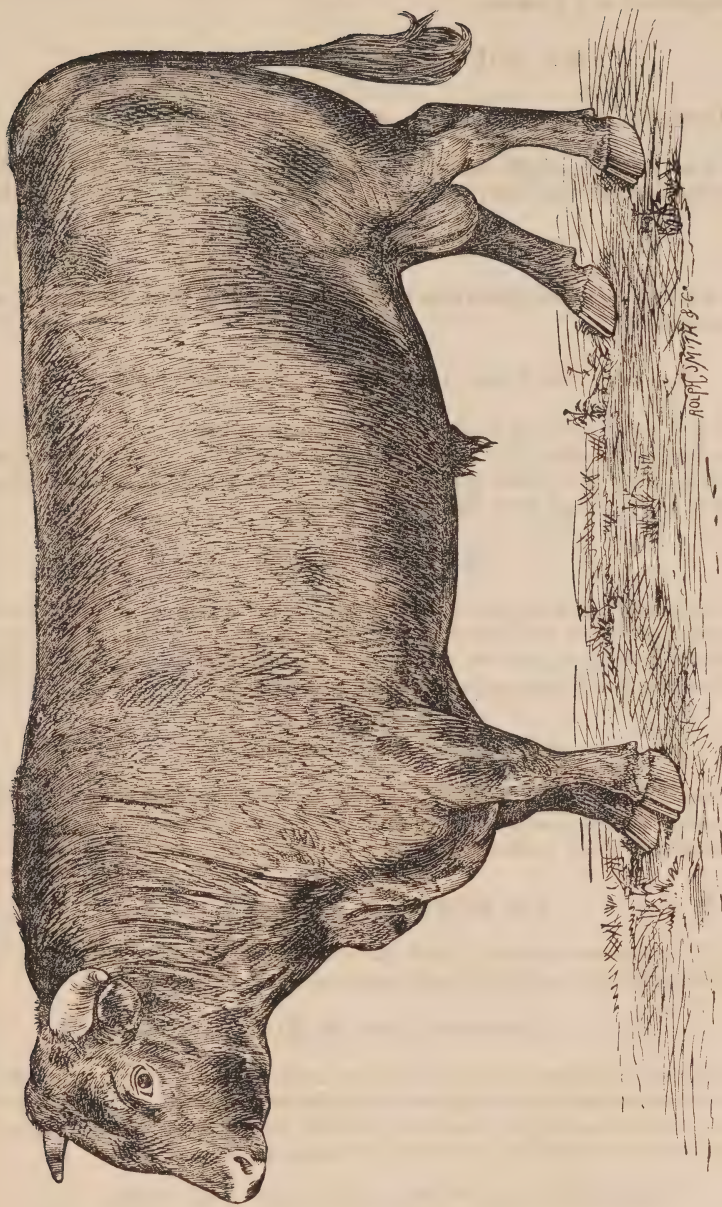
AYRSHIRES' YIELD OF MILK.

I have had some Ayrshires that gave 9,000 pounds of milk during the season, but 3,000 pounds for the six months during which the factory was open, is a good yield. A thoroughbred Ayrshire should give from thirty-five to forty-two pounds per day while on the grass, which is about double the yield of a common animal.

CHEESE DAIRYING—WINTER MANAGEMENT OF STOCK.

I send the milk to the cheese factory; the whey is sold to the highest bidder, who takes it away to feed hogs. In the winter I tie my stock up in warm stables, feeding them on straw and turnips until near calving time, when I give them some hay, and some bran and chopped stuff mixed.

[*Mr. Douglass.*]



DEVON BULL.

PASTURES—SOILING—MANURE.

In summer they are allowed to run in the pasture, and are also soiled to some extent. The manure is kept as well as possible, and during the winter the yard is cleaned, and the manure put in heaps in the field.

LAND PLASTER ON GRASS.

I have used land plaster on timothy, and find it of very great benefit, and I have also used it with good effect on barley just as it is coming through the ground. I do not think that plaster is diminishing in value. I use from seventy-five to one hundred pounds per acre.

SALT AS A FERTILIZER.

I have used salt, but have not noticed the results from it which I expected, though I believe it had a good effect in keeping off the grub from the turnips

SALT IN CHEESE FACTORIES.

English salt is used in the cheese factory of which I am the manager. We have used the Goderich salt, but without using any particular brand. Mr. Harris, of Herkimer County, New York, who has been sent out among the Canadian cheese factories by the Dairymen's Association, stated in our factory that English salt was the purest we could use for dairy purposes, and he conveyed the impression that the Canadian salt is not so pure as the English. Our cheese maker has been bound by the directors to use a certain brand of English salt on the ground that it is the purest.

USES OF THE DURHAM AND THE AYRSHIRE.

I agree generally with previous witnesses as to the usefulness of the Shorthorn for improving common cattle, but I prefer the Ayrshire for milk, and they also do very well for beef. I sold a thoroughbred Ayrshire bull, which weighed 1,800 lbs., and some cows which reached 1,200 lbs. We generally get for good grade steers for shipment to Europe about five cents per pound when they are three years old. I think dairying has been of very great advantage to farms which have been over cropped.

DONALD DOUGLASS.

Sitting to take oral evidence, held at Bowmanville, October 20, 1880. *Present—*
Messrs. DRYDEN, M.P.P. (Chairman), AYLSWORTH and DYMOND.

MR. WM. COURTICE'S EVIDENCE.

WILLIAM COURTICE, of the Township of Darlington, County of Durham, was called and examined.

He said:—I work 800 acres of land, and am engaged in mixed husbandry. I raise grain as well as stock.

DEVON CATTLE.

I have some pure Devon cattle, but my milch cows are grades of various kinds. The Devon cattle fatten very easily, and make a large amount of beef on small feeding. They are also good butter cows, giving an extra quantity of very rich milk. I send the milk to the factory. I have not given much attention to stall feeding. There is a difficulty now in getting pure Devon bulls for crossing. I imported pure-bred Devons at first. I and my brother have three bulls now, and one yearling.

[Mr. Courtice.]

QUALITY OF THE DEVONS.

Devon calves require to be well attended to, so that they get a good start. There is not much demand for Devons now, either in the United States or Canada. The Devons make a very good cross on large, roomy cows, which have two or three crosses of the Durham in them; but I would not recommend them for crossing on the common stock of the country. I think they give better milk but not so much as Durhams of a good milking family.

PRICE OF DEVON BULLS—CALVES.

I sell Devon bulls at from \$50 to \$100, according to quality. They are young bulls, two years old. I do not raise many steers for the market. If I wanted to raise a calf well, I would either let it suck or give it new milk, and when it is old enough I would give it meal or oil cake. I pasture my cows principally on flats which have never been broken up, though I keep some cultivated pasture.

ROTATION OF CROPS.

I do not practise any particular rotation of crops. I generally seed after roots, mow the land two or three years, and then break up for peas.

CLYDE HORSES.

I raise heavy horses, using only pure-bred Clydesdale stallions. I find a market for heavy horses in the United States. Such horses must be out of heavy mares, having three or four crosses. For such horses, two years old, I have got \$150. They average from \$150 to \$200, and pay very well.

WILLIAM COURTICE.

HOLSTEIN CATTLE.

None of the witnesses examined having any knowledge from personal experience of the characteristics and merits of the Holstein breed of cattle, correspondence with the owners of several herds of Holsteins in the United States has elicited the following information on this subject.

LETTER TO THE "RURAL NEW YORKER," BY WING B. SMITH.

Grazing upon the meadows of Holland can be seen great numbers of cattle, large, finely formed, wonderfully symmetrical, fully developed, uniform in colour and general appearance, with a remarkable development of the milk-producing organs, whose yield at the pail fully realizes the promises of their development.

Some of the choicest of these animals have been imported into this country, and they, with their descendants, constitute the Holstein breed of cattle of the United States. It must be borne in mind, therefore, that the Holsteins are not an experiment either in Holland or in this country, having been known here since 1852. No other breed known to us can so directly trace their lineage back for so many centuries.

MILK RECORDS.

Americans, tired of humbugs, demand more than unreliable statements, surmises and estimates, and insist upon facts in the form of reports and records fully substantiated by
[*Holstein Cattle.*]



HOLSTEIN BULL, "UNCLE TOM"—OWNED BY SMITHS AND POWELL, SYRACUSE, N.Y.

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unquestionable proofs, coming from persons well known, and consisting of weights, measurements, tests, etc., and these I will now give in proof of the correctness of my statements. The most essential quality in a cow for the dairy or farm, lies in her capacity for giving a large yield of milk. Now I unhesitatingly assert, that the Holsteins, as a breed, are the most abundant milkers known. In proof of this statement, I place before the *Rural* readers the following records, selected from among the very many now in my possession, many of which have been furnished me by prominent and trustworthy breeders and owners, embracing animals of almost every important herd of Holsteins in this country:

EXTRAORDINARY PERFORMANCES.

Crown Princess's largest daily yield is 76 pounds of milk; and largest yearly yield 14,027 pounds. Topsy produced $40\frac{1}{2}$ pounds of milk in a day, before she was two years old. Maid of Twerk, in 286 days or nine months and ten days, gave 11,618 pounds of milk, an average of 40 6-10 per day. Her largest yield was $71\frac{1}{4}$ pounds of milk in a day. Verta averaged 52 2-10 pounds for eighty-five days. Johanna, imported in 1878, calved July 23rd, 1878, and averaged 72 pounds of milk per day, during last week in August; largest yield in one day, 78 pounds. Gentle Annie has had three calves, her first at twenty-three months old, and has consequently been in milk three continuous years, during which time she has given 26,860 pounds 14 ounces of milk, or an average of $8,713\frac{3}{4}$ pounds per year, for the three years in milk commencing at two years old. Jufrau has completed her third continuous and consecutive year at 11,680 pounds per year. Janeka, her fourth year, at an average of 10,090 pounds per year. Lady Clifeden (imported October, 1874,) calved February 1st, 1875, gave 2,093 pounds of milk in March, an average of 67 16-31 pounds per day. Record for 362 days, 16,274 pounds or 7,745 quarts of milk, an average of 21 143-362 quarts per day; largest yield in a day 75 pounds. Maid Marion (imported) gave 21 quarts per day for six weeks; she gave 11,112 pounds in 365 days. Lady Andover gave, from October 1st, 1876, to June 1st, 1877, 9,856 pounds, an average of 35 67-91 pounds per day. Zwaan gave 12,009 $\frac{1}{2}$ pounds of milk in a year. Astrea, eight years old, gave 80 pounds per day for ten days. Maid of Twisk, five years old, gave in 303 days, 12,593 $\frac{3}{8}$ pounds, an average of 47 7-16 pounds. The next year she gave 14,312 pounds, an average of 44 pounds 7 ounces; her largest yield was $90\frac{1}{2}$ pounds in a day. Jacoba Hartog, two years old, in 358 days gave 10,430 $\frac{1}{4}$ pounds, an average of 29 7-16 pounds per day. Sitjtje Blecker, two years old, in 365 days, gave 10,711 $\frac{5}{8}$ pounds, an average of 29 $\frac{3}{8}$ pounds per day. Neiltja Korndyke, two years old, in 365 days gave 9,932 $\frac{3}{4}$ pounds of milk. Maid of Twisk, averaged for thirty days, 73 1-6 pounds of milk a day.

The cow, Eva, for three consecutive months, averaged 42 quarts of milk a day; this was in the months of September, October and November, and during the following five months she averaged 30 quarts daily, making 8,352 quarts of milk in eight months. Eva 2nd, at two years and six months old, with her first calf, gave an average of 20 quarts of milk a day for six months. Three months after dropping her second calf, she gave 28 quarts of milk a day. In a herd of fourteen fully matured cows, not one of the fourteen will give less than 60 pounds of milk a day, when in full flow.

BUTTER RECORDS.

As to quality of the milk, we believe it is universally conceded that the butter and cheese of Holland are rarely excelled, and to the breeder or dairyman, another vital point is the quantity of butter given. Records prove more than mere statements. Maid of Twisk gave 14,312 pounds of milk in a year; actual experience proves that $20\frac{1}{4}$ pounds of milk made 1 pound of butter, which gives 706 $\frac{3}{4}$ pounds of butter in one year.

Snow Flake, two and a half years old, gave 10 pounds a week. Texelaar produced 17 pounds 14 ounces of butter from cream of six days' milking. Texelaar 9th produced 12 $\frac{3}{4}$ pounds per week, and her daughter 14 pounds of butter in a week.

[*Holstein Cattle.*]

Sixty-eight pounds of milk taken from two cows (Maid and Jacoba) were set aside the cream taken off when milk was sour and churned by itself in a common "dasher" churn, with the following result: $3\frac{1}{2}$ pounds of butter to 68 pounds of milk, or 1 pound of butter to 19 3-7 pounds of milk; butter was weighed before salting, and milk thoroughly washed from the same. From the daily milkings of Eva 3 pounds of butter were made for long periods. To prove the importance of Holland as a dairy country, let me state that one small province of that country exports nearly 5,000,000 pounds of butter annually to the markets of Continental Europe and the British Isles. Holland exports annually 32,000,000 pounds of butter and 61,000,000 pounds of cheese, which, for so small a country, is truly remarkable.

FLESH-FORMING CAPACITY.

The next most prominent feature of these cattle, and one of great importance to the breeder, is the readiness with which they take on flesh, and its quality. Experiments without number have proved that Holsteins take on *more* flesh with the *same* food than any other breed of corresponding weight.

COMPARATIVE MILK RECORDS.

Professor Lehmann, in charge of the experimental agricultural station at Pommeritz, selected from both Shorthorn and Holland races cows that had passed their sixth year, but which were not so old that their age affected the flow of milk. The experiment of milking commenced July 31, 1866, and terminated July 30, 1867, occupying precisely 365 days, during which time there were yielded by four Shorthorns 27,240 pounds of milk, or an average of 6,081 pounds per cow, while four Hollanders yielded 32,136 pounds, or an average yield of 8,034 pounds per cow. Highest yield by Shorthorns, 7,643 pounds; highest yield by Hollanders, 9,411 pounds. The same food, keeping, care, and surroundings, which in the Shorthorns produced 100 pounds of milk, produced 118 4-10 pounds in Hollanders, or fully 18 per cent. in favour of the latter as milk-producers.

EXPERIMENTS AT ELDENA.

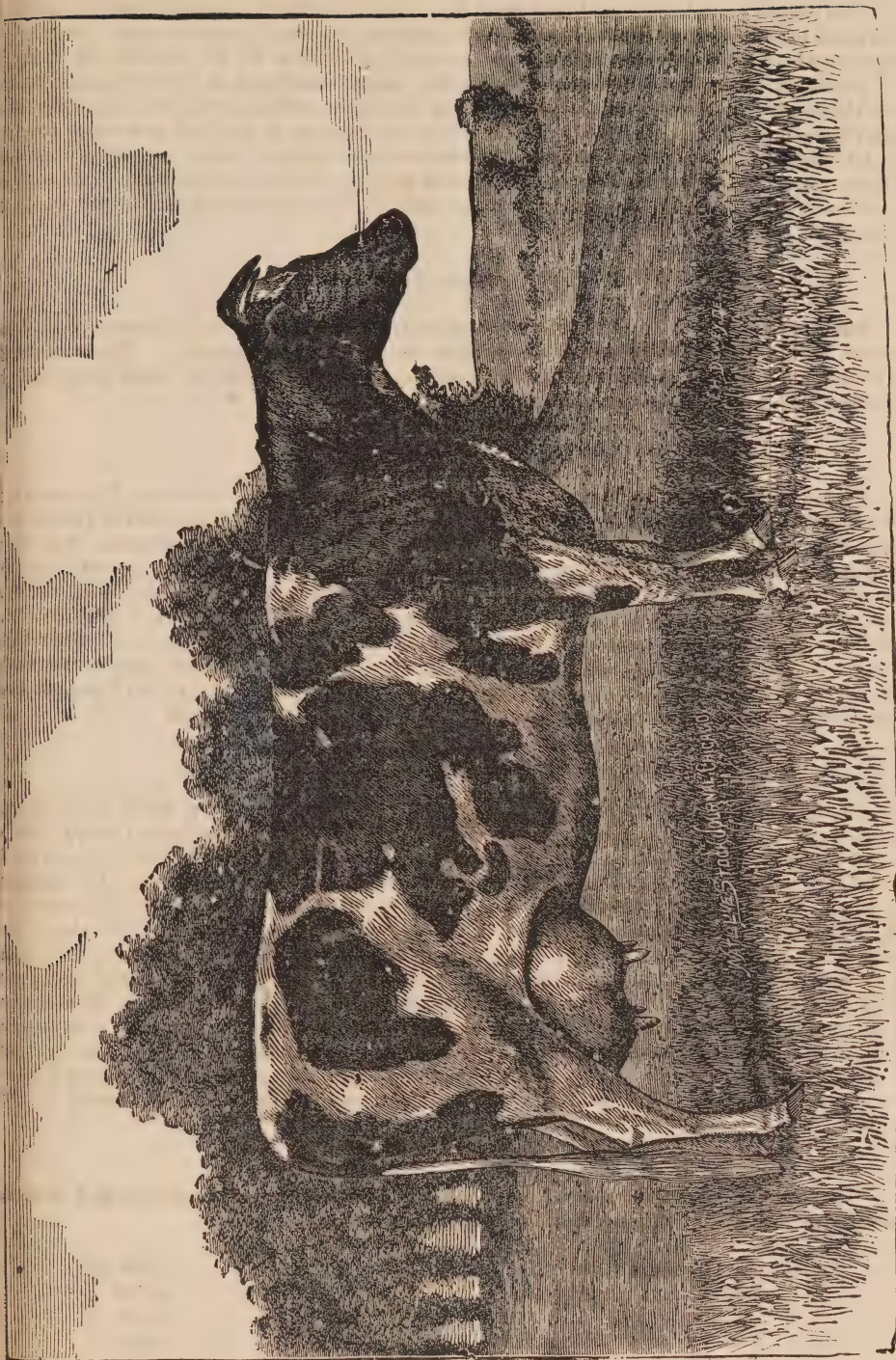
At the Agricultural Academy at Eldena, many experiments were made in feeding and milking cows, etc., and very precise accounts were kept of the product of every cow, as well as of the expense of keeping her; and it was found that three Ayrshire cows averaged 2,247 quarts of milk per cow, while twenty-two Holland cows averaged 4,437 quarts per cow. Highest yield by Ayrshires was 3,811 quarts; highest yield by Hollanders, 5,677 quarts. The Hollander consumed about five pounds of hay, or the equivalent, to every quart of milk yielded, the Ayrshire nine pounds of hay to every quart of milk. One other experiment conducted by Villeroy, resulted in showing that 100 pounds of hay produced in Hollanders 28.92 quarts of milk, in Devons, 19.13 quarts, and in Herefords 15.97 quarts. Baron Ockle, in Frankenfelde, made a comparative experiment with Ayrshires and Hollanders, the average weight of the Ayrshires being 806 pounds, that of the Hollanders, 1,016 pounds. The experiment showed that the Ayrshires consumed 33.10 pounds of hay for every 100 pounds of live weight, while Hollanders consumed 28.10 only.

RECORDS OF LIVE WEIGHTS.

I have claimed for this breed of cattle a place among the beef animals, and would sustain my position by offering the following actual weights:

Bull,	4th Highland Chief	2,700 lbs.
"	First Consul	2,120 "
"	Dictator	2,140 "
"	Uncle Tom, at 26 months	1,525 "

[*Holstein Cattle.*]



HOLSTEIN COW, "NETHERLAND QUEEN"—OWNED BY SMITHS AND POWELL, SYRACUSE, N.Y.

Bull,	Ploen, 2 years	1,022 lbs.
"	Chieftian, 21 months	1,425 "
"	Wild Eyes, 11 months	950 "
"	Calf, Pedro, 8 months	550 "
Cow,	Virginia, 6 years	1,695 "
"	Finesse, 8 years	1,625 "
"	Lady Texal, 6 years	1,780 "
"	Lady Clifeden, 9 years	1,580 "
"	Lavinia	1,500 "
"	Isis, 4 years	1,510 "
"	Mary	1,350 "
"	Aaltje Hengeveld, 5 years	1,280 "
Heifer,	Mabel, 3 years 10 months	1,400 "
"	Minnie Wrinkle, 3 years 10 months	1,320 "
"	Aagie Hertag, 3 years	1,112 "
"	Altonia, 3 years	1,174 "
"	Meika, 21 months	1,010 "
Calf,	Anna, 11 months	770 "
"	Jenny, 11 months	690 "
"	Sappho, 10½ months	700 "

The above cows were all in milk at time of weighing, and not in extra flesh, and had they not been in milk at the time of weighing they would have weighed very much more. I could extend this list indefinitely, but space does not permit.

ADAPTABILITY TO CHANGE OF CLIMATE.

Holsteins have now been introduced into many of our States, and without reference to climate, soil or location, they thrive as well and furnish equal records of milk in Virginia, Massachusetts, Vermont, New York, Illinois or California. Be it on the highlands or lowlands, in the cold climes or warm, under all circumstances, with all kinds of food, and divers manners of supplying it—under all these conditions they still maintain that same superiority as milkers and beef animals with which they have been here accredited. They are remarkably vigorous, and are seemingly little given to disease; and standing beside the popular breeds of this country, they are far less affected by the extremes of our variable climate than others, while they bear exposure far better than most other breeds.

THEIR PREPOTENCY.

The power of transmission of prominent characteristics by the Holstein males is remarkable; for they invariably stamp their progeny with the colour markings, form and size of the breed, as well as with its all-essential milking qualities. This power is not confined to crosses with our native or grade cows alone, but is equally manifest in crosses on full-blood animals of any breed or race.

A few instances that have come under my personal observation are sufficient to satisfy my readers on this point. Dolly Dutton's dam was a grade Durham that would hardly give milk enough to raise her calf, while Dolly on coming in at 18 months gave thirty-eight pounds of milk a-day. Another half-blood gave, as a two-year-old, on dry feed, 40 pounds of milk per day, and when put on grass, 42 pounds in a day. Favourite, a half-blood, came in at twenty months, and gave milk in good quantity for over two years without cessation, and it was with difficulty she was dried off before her third calving. And here let me state, as one of the very prominent, and to the breeder an all-important characteristic of cows of this breed, their continuously large flow of milk during the whole year, as it is often with difficulty the cow can be dried off before calving.

After the presentation of such an array of facts as the foregoing, I feel justified in saying that in the Holstein cattle, the breeders and dairymen of the United States will

[*Holstein Cattle.*]

find a breed possessing more desirable qualities and more fully meeting the demands and the wants of this country than any other: for in them we have size, form, finish, wonderful development, uniformity in colour and general appearance, vigour and the production of remarkable quantities of prime milk, butter, cheese and beef.

Onondaga Co., N.Y.

EXTRACT FROM LETTER FROM W. SINGERLY OF "THE PHILADELPHIA RECORD."

I have had nearly two years trial of the Holsteins. I have some forty, old and young, and I think they are beyond question the best breed of cattle, for the farmer, known. Cows give from 50 to 60 pounds of milk per day, and milk close up to calving. I sent you photos. You will notice one named "Dairy Maid." She is due to calve in fifteen days, and is now giving 24 pounds of milk a day. Heifers, that come in at twenty-four and twenty-six months old, are giving 40 to 46 pounds per day. The records of some half-breeds show almost as well.

WM. SINGERLY.

EXTRACT FROM A LETTER FROM MESSRS. SMITHS & POWELL OF SYRACUSE.

A. H. DYMOND, Esq.,

Ontario Agricultural Commission, Toronto.

Dear Sir,—Mr. Singerly, of Philadelphia, requests us to send you such printed matter as we have that treats on Holstein cattle, their history, characteristics, etc. We comply with his request with much pleasure, and herewith mail you a *Rural New Yorker* that contains an article on Holsteins, also a catalogue of our own herd of Holsteins, and enclose a record of their milking. Favour us with a careful perusal of all of these. Our experience with this breed of cattle has been most satisfactory. We have made a careful study of the breed, its origin, growth, native country, its prominent characteristics, etc., and after several trips through Holland, visiting many farms where these cattle are, importing, breeding and observing the effect of change of location, we have decided in our own minds that they are the coming breed for milk or milk and beef combined. Our herd now numbers about 150 head, and our record proves their superior merit.

SMITHS & POWELL.

SYRACUSE, N.Y., December 3rd, 1880.

LETTER FROM EX-GOVERNOR SEYMOUR.

A. H. DYMOND, Esq.,

Office of the Ontario Agricultural Commission,
Toronto, Ontario.

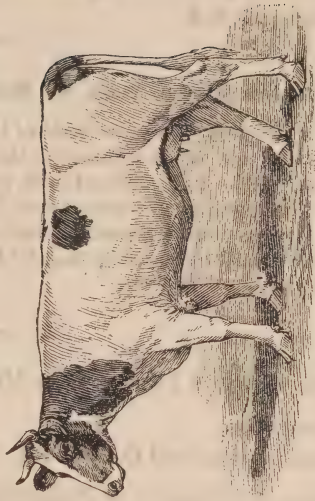
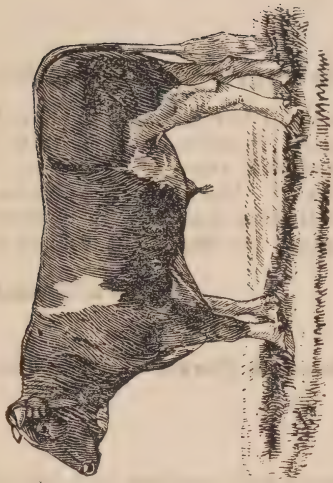
Dear Sir,—Governor Seymour requests me, in reply to your letter of inquiry, dated the 24th instant, to say that he is too ill to write except by the hand of another. He says the Holstein cattle are thought well of by our farmers. They grow to a large size, and are free milkers, and while the milk is not so rich as that of some other breeds, yet it is rich enough for cheese. They are gentle cattle and best adapted to smooth and rich pasture, and make good beef. Mr. Gerrit S. Miller and Mr. Dudley Miller of Peterboro, in Madison County, have imported and kept first-class specimens of this breed, and so does Mr. James Neilson, of New Brunswick, New Jersey, and there is a fine herd within four miles of Utica.

Very truly yours,

JOHN J. SEYMOUR.

UTICA, November 26th, 1880.

[Holstein Cattle.]



HOLSTEIN CATTLE, OWNED BY W. SINGERLY, PHILADELPHIA.

MILK RECORDS OF THOROUGHBREED HOLSTEIN COWS OF THE FARM OF SMITHS & POWELL, FOR ONE DAY, AND FOR ONE TO SIX MONTHS, ACCORDING TO TIME IN MILK, TO DATE, AUGUST 24TH.

	7 years old,	74½ lbs. in 1 day.	2,206½ lbs. in 1 month.	9,805½ lbs. in 6 months.	11,744½ lbs. in 8½ months.
Neilson	7	71½ "	2,140½ "	9,250 "	11,644½ "
Janek	7	82½ "	2,289½ "	10,904½ "	14,402 "
Egis	6	84½ "	2,362½ "	9,568½ "	13,540½ "
Aggie	6	50½ "	1,439½ "	6,482 "	9,039½ "
Juniata	6	64½ "	1,891½ "	6,278½ "	9,158½ "
Poreleitje	6	55½ "	1,537 "	6,799½ "	10,113½ "
P. of Beemster	4	64 "	1,755½ "	5,562½ "	sold.
Sappho	3	52½ "	1,535½ "	5,243½ "	7,810½ "
Duchess of F.	3	49½ "	1,366½ "	5,619½ "	7,907½ "
Finesse	3	45½ "	1,344½ "	7,056½ "	9,891½ "
Lady of the Lake	2	45 "	1,240½ "	6,431½ "	8,304½ "
Ethel	2	47½ "	1,262½ "	5,771½ "	8,453½ "
Imogenia	2	44½ "	1,243½ "	5,641½ "	8,226½ "
Matron	2	43½ "	1,249½ "	5,536½ "	8,192½ "
Iola	2	44 "	1,249½ "	4,952½ "	6,850½ "
Harvest Queen	2	41½ "	1,151½ "	5,254 "	7,447½ "
Butterfly	2	41½ "	1,183½ "	5,153½ "	7,590½ "
Mermaid	2	44½ "	1,288 "	3,245½ "	5,973½ "
Egis 2nd	2	40½ "	1,115½ "	3,148½ "	5,635½ "
Lakeside Belle	2				

Netherland Queen made a two-year old record in 1879 of 58 lbs. 12 oz. in one day; 1,670 lbs. 9 oz. in one month, and 13,574 lbs. 3 oz. in one year. Maid of Purmer in 1879 made a two-year old record of 10,893 lbs. 1 oz. in one year.

LETTER FROM MR. GERRIT S. MILLER.

A. H. DYMOND, Esq.

Dear Sir,—At the request of Mr. Singerley, of Philadelphia, I will cheerfully give you whatever information you may wish regarding Holstein cattle. I mail you a copy of Holstein Herd Book, Vol. 3; in it you will find a short sketch of the history of the breed, and a few other interesting items. The great advantage the Holstein has over other breeds is in its *combination of valuable qualities*. 1st, it is the *greatest* and most *economical* milk producer; 2nd, the milk is better adapted to general use, such as the milkman, family, cheese factory, and at the same time makes excellent butter (some of the smaller breeds will make a pound of butter from less milk than the Holstein, but their milk is not so desirable for other purposes); 3rd, they are of large size, fatten quickly, and make excellent beef; 4th, they seem to *thrive* in *hot, cold, and damp* climates, and are possessed of hardy constitutions. I have been breeding these cattle since October '69, when my first importation came from Holland, and am more than ever satisfied that they are the best breed for general use.

GERRIT S. MILLER.

PETERBORO, MADISON Co., N.Y.

POLLED ANGUS, OR ABERDEEN POLLED CATTLE.

(From "*Wallace's Monthly*," November, 1878.)

It is now eighty years since Mr. Watson of Keillar in Forfarshire, founded his herd. This takes us back to a period contemporaneous with the early improvers of the Shorthorn. As a race, the Polled Angus are probably nearly as old and well established in their characteristics as the Shorthorn.

McCOMBIE, OF TILLYFOUR.

In 1832, the most famous breeder of this variety, McCombie,* of Tillyfour, founded his herd, and he has carried forward his enterprise to this day without flinching throughout all the Shorthorn fever that has raged around him. To the Angus breed of cattle, he has been what the Collings were to the Shorthorns, and his skill and judgment have resulted in the production of much such an animal as the Collings produced.

A BEEF-MAKING ANIMAL.

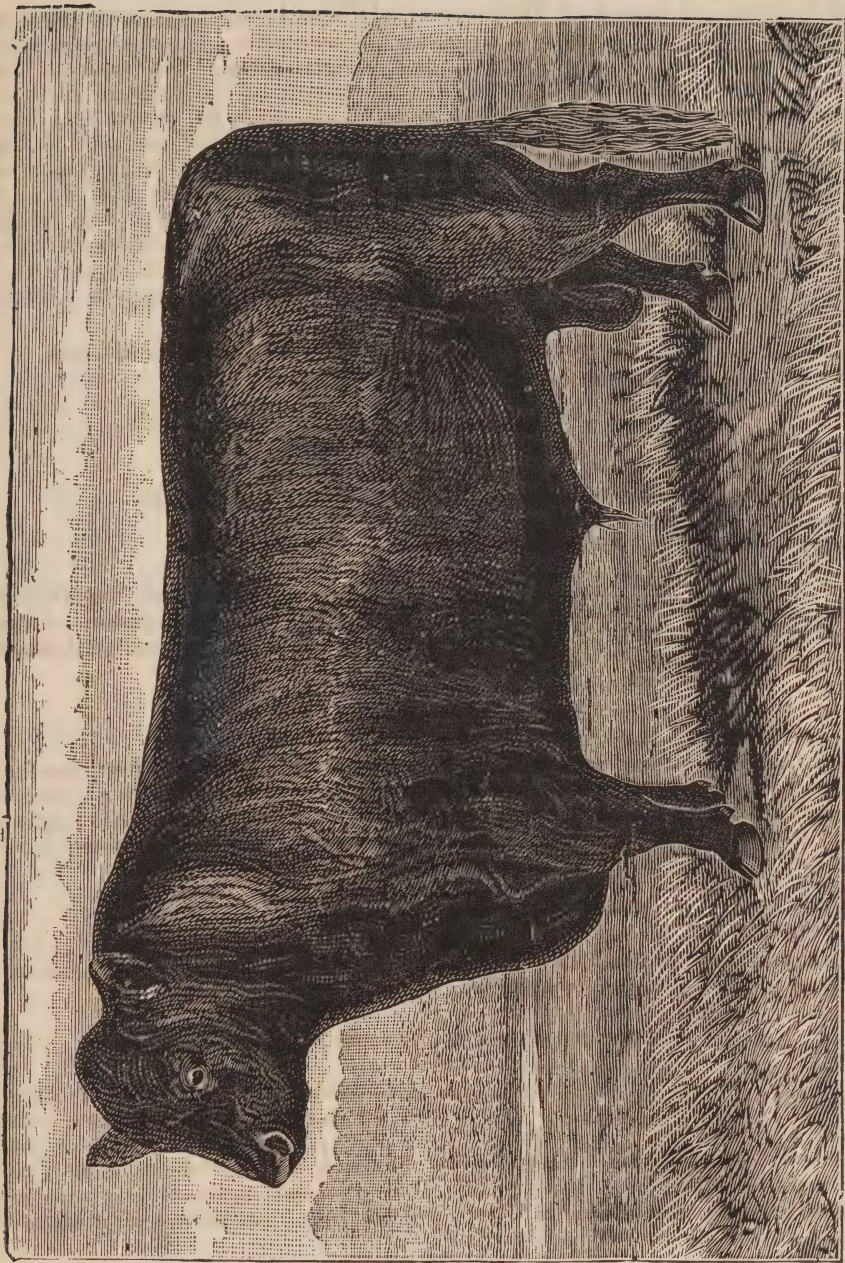
His aim has been a beef-making animal, all black, and without horns. As evidence of their quality in this particular we will cite a few instances.

THE POLLED ANGUS AS PRIZE WINNERS.

At Poissy, in 1862, a bullock of this breed won Prince Albert's cup, against all the breeders of the world; they have twice carried off the champion cup at Smithfield in recent years, and they have frequently gained the chief prize at Birmingham. When we consider that a single county, away down in Scotland, has a breed of cattle that oftentimes meets and beats all the Shorthorns, Herefords, and Devons of England, we must conclude, that as beef producers, that breed has been brought to a high state of perfection.

*Mr. McCombie died since the above was written, and his fine herd was sold by auction on the 26th of August, 1880, and dispersed.

[*Polled Angus Cattle.*]



POLLED ANGUS BULL.

QUALITY OF THE BEEF.

It is claimed for this breed, and I am disposed to think the claim is just, that the beef itself is better than the beef of any other breed, and brings more in the markets of the great cities.

GOOD CONSTITUTIONS—MILKING QUALITIES.

Like all the Scotch cattle, this breed have hardy vigorous constitutions, and are very prolific. They are gentle in disposition, and mature very early. As milkers, they are not distinguished, for they have not been bred for that purpose. They are generally jet-black, with fine glossy coats, and plenty of hair. They grow to a large size, and are easily fattened at almost any age. It is claimed for them, also, that they weigh heavier than any other breed to their measurement, which makes them attractive to buyers for the fat market. It is an established fact that Polled cattle sell better in the English market than any others.

THE SHORTHORN.

It is conceded on all hands, that as a beef-producer, the well-fatted Shorthorn ox is very near perfection. For many generations he has been bred for perfection of form—the greatest amount of beef with the smallest amount of offal.

THE HORN.

Now, all we want is the same ox without the horns. For many generations the Angus Polled ox has also been bred for perfection of form—the greatest amount of beef with the smallest amount of offal, and there is of necessity, a most striking resemblance of form between the two breeds. In respect to form, then, the cross between them would not be a violent one, and we would not expect any deterioration in that form.

EFFECT OF CROSSING WITH THE SHORTHORN.

It is probable that the size of the Shorthorn would be somewhat reduced, which might not be a disadvantage, but his quality would not be impaired. Indeed there can hardly be a doubt that the quality of the meat would be improved. On this point, however, we are not left to reason or conjecture, for the cross has been tried with most happy results. A distinguished Scotch authority says: "Of all the varieties of cross-bred cattle, there is none more satisfactory or remunerative to the feeder than the cross between the Polled Angus, or Aberdeen, and the Shorthorn. It grows to a large size, shows great aptitude to fatten, and when killed, the fat and lean are found to be distributed over its carcass in most desirable proportions."

THE DURHAM'S HORNS.

The horn of the Shorthorn cattle is less a characteristic and feature of the breed than any other tribe of horned cattle with which I am acquainted. In the females especially, its development is generally unsatisfactory from its uncertainty. It never has a strong, robust growth, and there is no telling what shape it may assume. There is a kind of unhealthy tenderness about it that makes one afraid all the time that some slight contact may knock it off. It seems hardly in accordance with the nature of the animals to develop horns at all, and some of them get little beyond the merest rudiments of horns. Indeed we believe there have been instances where they failed to develop even rudiments. It follows then, that of all the tribes of horned cattle, the horns would be the most easily eliminated from the Shorthorns by the introduction of Polled blood. The introduction of a bull of a vigorous and prolific stock of the Polled Angus into a herd of Shorthorn cows would be very apt to result in a large majority of the progeny being without horns.

[Polled Angus Cattle.]

It would be curious to note what the proportion with or without horns would be, but I think it is philosophical to conclude that the strong no-horn element in the bull would be apt to eliminate the very feeble horn element in the cow. With this as a result in the first generation, a foundation is laid, on which the breeder can build as his judgment or fancy may dictate.

THE POLLED ANGUS BREED.

By MR. THOMAS FERGUSON, a Correspondent of "*Wallace's Monthly*," Feb. 1879.

THE POLLED ANGUS FOR BEEF.

I live within a short distance from Keillar, the cradle of the *Improved Polled Angus Cattle*. Have myself been a breeder of them for forty years, and can corroborate every word you say regarding them as a famous beef-producing race. The beef from them is also of unequalled quality, a quality which is sufficiently indicated by the fact that prime Polled Scots uniformly bring the highest price per stone in the London market.

HORNS ON SHIPBOARD.

I do not require to say anything of the advantages which they possess over horned cattle in a car or steamship voyage, as your article is quite conclusive on that head, and it must be evident to everyone that in a long voyage, where cattle are packed pretty closely together, the absence of horns must conduce greatly to the comfort and consequent well-doing of the animals. The horned American cattle, which have been shipped to this country have not been the description of cattle which can be carried here at the least risk and expense, but the introduction of Polled Angus bulls of good pedigree into your Shorthorn herds would speedily remedy this state of matters.

PREPOTENCY.

No bulls imprint upon their progeny their own character and qualities so quickly; and the result of the introduction of a Polled Angus bull among a herd of Shorthorn cows would be a vigorous race of cattle, most of them, if not all of them, black and polled like the sire. I have known a herd of twenty West Highland cows—a breed of cattle with very long and strong horns—being served with a Polled Angus bull, and every calf was polled, most of them jet black, but a few of a dun colour. In the higher or glen districts of Perthshire, this West Highland, long-horned breed used almost exclusively to prevail, but through the persistent use of Polled bulls the cattle in this district are now almost all black and polled, quite as large in size and of as good quality as the pure Angus.

CROSSES ON THE SHORTHORN.

By crossing your American Shorthorns with polled bulls, you would improve them, both in appearance and quality, and also make them much hardier. I have sold Polled bulls in Ireland frequently for use in Shorthorn herds, and the results have always been highly satisfactory, in evidence of which those breeders who have adopted this system still continue to buy bulls from me. The Polled bulls I consider would greatly improve the quality of your American cattle without reducing their size.

MATURITY—PRIZES.

It is a mistake to suppose that Angus cattle do not come so soon to maturity, or grow to so large a size as Shorthorns. I have year-old and two-year-old Polled Angus cattle larger than any Shorthorns or crosses of the same age in this district, and this is saying something, for a very near neighbour of mine, Mr. Fisher Keithick, Coupar-Angus, has a herd of Shorthorns second to none. At a sale he had four years ago, one of his cows was sold to America for 280 guineas. His Shorthorns and my Polled Angus came

[*Polled Angus Cattle.*]

together in the adjudicating ring of our local show, held at Coupar-Angus, in the summer of 1877, when a cup was offered by the citizens for the best animal in the cattle classes, irrespective of breed or age. The Shorthorn contingent on that occasion included animals that had cost hundreds of pounds, some of them bred by such noted breeders as the late William Tarr, Aylesby Manor; Messrs. Atkinson, Bessy, etc., etc., and yet the cup was awarded to me for an Angus heifer bred by myself. The sire of this heifer, and also of all my other young stock, after having served over forty cows during last spring and summer, gained the first prize at the Highland and Agricultural Society's show at Dumfries last July. He is my stud bull, and although kept in moderate condition for serving, his present live weight is 24 cwt. A heifer by him, which also gained first prize in her class at Dumfries, at the present time girths over 7 feet, her age being under two years, and some of my other heifers of the same age are equally as large. I mention these facts simply to show that Angus cattle come as early to maturity, and grow to as large a size as Shorthorns.

MILKING QUALITIES—THRIFTINESS.

As to their milking properties, it can be seen from the enclosed letter from Lord Airlie, Cortachy Castle, Angus-shire, which appeared in the *North British Agriculturist* of 1st January, that he has at present seventeen pure Angus cows in his dairy, the greater number of them giving twelve to fourteen, and sometimes sixteen, Scotch pints, for a considerable time after calving. The milk from them is of a very superior quality, as good as that got from Alderneys, and very much superior to that of either the Shorthorn or Ayrshires. They are thrifty cattle and excellent doers, and from practical experience I unhesitatingly affirm that three of them can be kept on the keep of two Shorthorns.

Although I have all my life been a breeder of cattle, this is more of a feeding than a breeding district. We are largely dependent upon Ireland for our supply of feeding cattle, and although the Society for the Prevention of Cruelty to Animals is doing its best to prevent the "barbarous and cruel" operation of horning, the inhuman practice still to a certain extent prevails. Ireland, however, is now finding it to her interest to use Polled bulls extensively for crossing with her horned breeds, and the necessity for this brutal practice is likely soon to cease.

IMPROVEMENTS OF THE BREED.

It is now about seventy years since the late Hugh Watson commenced his improvements on the Angus breed of cattle at Keillar, near Coupar-Angus, in this district, which is the native home of the breed.

From time immemorial, a famous race of Polled cattle had existed in this district, and those were the cattle from which Mr. Watson made his selections, and who may be said to have originated the *Improved Polled Angus Cattle*. His herd has had by far the greatest influence in improving the other Polled herds, and while he, who first made those cattle famous under the name of "Keillar Doddies," has departed, the breed itself has extended not only over the British Isles, but far beyond; and Mr. McCombie of Aberdeenshire, and Hannay of Banffshire, not to name hundreds of other celebrated breeders, have assisted in widely disseminating this once local variety.

EXTENSION OF THE BREED.

The late Mr. Watson, when examining my herd a short time previous to his death, expressed his opinion to me that an enormous field, both in Scotland and the world at large, was open to reward the energy of breeders of Polled cattle. This prediction has since, to a large extent, been realized.

The Polled cattle are now the prevailing breed in the counties of Kincardine, Aberdeen, Nairn, Banff and Elgin, and are rapidly becoming the national breed of Scotland. Ireland finds it to her interest to use Polled bulls extensively for crossing their

[*Polled Angus Cattle.*]

horned breeds, and they have also found their way into numerous English counties. In deed, the "improved Angus Doddies" have already obtained a world-wide reputation shipments of high-priced animals being made to many of the European countries as well as to your own country and Australia. At the time the late Mr. Watson commenced his improvements on the breed, but little attention was paid in this country to the quality or improvement of the various breeds of cattle. At the present time, however, the desire in all countries for improved breeds of cattle is everywhere most marked, and so far as I can see, the "Doddies" of Angus-shire are the animals destined to supply this universal want. They won everlasting honours at the late Paris Exhibition, and now the whole world demands them; while we may expect that the return of more prosperous times than the present will but increase the necessities of the various continents."

LETTER FROM LORD AIRLIE ON THE MILKING QUANTITIES OF POLLED ANGUS CATTLE.

I have read with interest the article on "Polled cattle for shipment abroad," extracted from a New York paper, which appeared in yesterday's *North British Agriculturist*. I should think the Polled Angus well suited to roughing it on the American prairies. As regards their suitability for crossing with the native breeds, the late Mr. Grant tried the experiment in Kansas, and he found the crosses from Polled bulls and American cows, arrived on an average at greater weight than crosses from cows of the same kind and Shorthorn bulls, age and treatment being the same. I observe that the writer of the article states that the Polled Angus cows are bad milkers. It is the fashion to say so; and no doubt if you breed exclusively for show-yard purposes, and for beef-producing, you will have a number of very indifferent milkers. The same thing might, however, probably be said of any herd, certainly of the Shorthorns. But if you want dairy cows, and select the right stock, you will not have much to complain of. I have at present seventeen Polled Angus milch cows in my dairy. The greater number of these give from twelve to fourteen, and sometimes sixteen Scotch pints for a considerable time after calving. The milk is admitted to be much richer than that of either the Shorthorn or Ayrshire. As regards the length of time for which they will continue to give milk, my cow, "Belle of Airlie," (1959), (dam of Belus 749,) as pure a Polled animal as any in the herd-book, used to be milked all the year round. Last year when I was from home they left off milking her about a month before she calved, and she died of milk fever, induced, as I believe, by the circumstance that she had not been relieved of her super-abundant milk.

The cow, "Miss McPherson," (1252) of the Erica tribe, which I purchased recently of Mr. Adamson, is now giving six Scotch pints per day, more than nine and a half months after calving. The dairy cows referred to were selected by me with a view to their milking qualities, and whenever I found the produce turn out bad milkers, I drafted and fed them for the butcher, except in a few instances, when from their shapes and blood I thought them likely to produce a valuable tribe of cattle.—I am, etc.,

AIRLIE.

MEMORANDUM ON VALUE AND MERITS OF VARIOUS BREEDS OF SHEEP.

(Prepared, at the request of the Commissioners, by PROFESSOR BROWN, a Member of the Commission.)

SUITABILITY, COUNTRY AND HARDINESS.

Very much of the success of sheep depends upon local peculiarities, such as temperature and soil, and also upon particular management. For weight in the shortest time, the Leicester is ahead in our experience; for quality of flesh and wool the Southdown and Oxford Down cross have given great satisfaction, and for hardiness we place the Southdown first, the Cotswold second, Oxford Down third, Lincoln fourth, and the Leicester last. More particularly in regard to wool value, the Southdown is first, then its cross;

[Professor Brown.]



HAMPSHIRE DOWN SHEEP.



SHROPSHIRE SHEEP.

Oxford Down third, Oxford Down cross fourth, Leicester fifth, and Lincoln and Cotswold last. In early maturing the order is—Leicester, Southdown, Southdown cross, Leicester cross, Oxford Down cross, and the slowest is the Cotswold.

PROFIT

In regard to profit, according to *present markets*, there is

For Breeding.	$\left\{ \begin{array}{l} \text{Southdown,} \\ \text{Cotswold,} \\ \text{Oxford Down,} \\ \text{Leicester.} \end{array} \right\} \text{Equal.}$	$\left\{ \begin{array}{l} \text{Oxford Down cross,} \\ \text{Southdown cross,} \\ \text{Leicester cross.} \end{array} \right\}$	For Feeding.
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BY LOCALITIES.

1. Southdowns for high-lying, exposed, light soils of a limey character.
2. Cotswolds for medium localities.
3. Oxford Downs for medium by present experience.
4. Leicesters and Lincolns for mildest districts.

HEALTHINESS.

The Southdown is least liable to diseases.

Lung disease is the most common sheep complaint, but not a matter of heavy loss anywhere.

SPECIAL ADVANTAGES OF SHEEP FARMING.

- Fewer risks by deaths.
- Two crops per annum.
- Consolidating and manuring light soils.
- Rich manure at all times.
- More easily kept on poor pastures.
- Less cost in buildings and winter management.
- Greater returns for money invested.

AVERAGE ANNUAL INCREASE.

The average annual increase in a flock of ewes is fully $1\frac{1}{2}$ lamb per head.

WINTERING SHEEP.

They should be allowed to choose out or in-doors at all times, giving thirty-five square yards per head.

AGE AND SEASON FOR MARKETING.

For Breeding.—It is most profitable to sell lambs in the fall, and shearlings next August and September.

For Flesh.—At the end of April and May; and all should be off when eighteen months old.

A COMPARISON.

The difference between the value of a well bred grade and a common sheep is thus shown:

	Common Sheep.	Improved Cross.
Common Wool, 5 lbs. at 27c.	\$1 35	
Improved Wool, 8 lbs. at 35c.		\$2 80
Common Mutton, 140 lbs. at 4c.	5 60	
Improved Mutton, 170 lbs. at 5½c.		9 35
	<hr/>	<hr/>
	\$6 95	\$12 15
		6 95
		<hr/>
Difference.....		\$5 20

Or, \$510 in a flock of 100.

WM. BROWN.

[*Professor Brown.*]

EVIDENCE ON WOOL.

Sitting to take oral evidence held at Toronto, August 3rd, 1880. *Present*—Mr. BROWN (Chairman), Hon. S. C. WOOD, and Messrs. THOS. STOCK, EDWARD STOCK, and A. H. DYMOND.

MR. JOHN HALLAM'S EVIDENCE.

JOHN HALLAM, of Toronto, was called and examined.

To Mr. Dymond.—I have been for twenty-two years in the wool trade. I have been chiefly a purchaser of Canadian wool.

CANADIAN WOOL BUYING—MARKET.

I buy the wool in the fleece, and also skin wool. The great bulk of the Canadian wool I sell goes to the United States.

VARIETIES OF CANADIAN WOOL.

The different classes of wool that I purchase in Canada are, the Cotswold, the Leicester, the Southdown, and the old Canadian, which is a wool now very much wanted by our manufacturers, and the demand is greater than the supply, but the wool is not very profitable to the farmers, as it is a light fleece.

CROSS-BRED WOOLS.

To Mr. Thomas Stock.—We have many crosses now, but the wool of some crosses is very poor, and the old Canadian wool of ten or fifteen years ago is going out entirely. Some of the crosses, however, are superior to the thoroughbreds for the production of good combing wool.

THE CROSS PREFERRED.

The cross I prefer is that of the Southdown and the Leicester, which I think gives us the best fleece for combing, equal to the pure Delaine wools, and the lambs' wool from this cross makes the most desirable clothing.

DEMAND FOR MEDIUM WOOLS.

To Mr. Dymond.—There has sprung up within the last two or three years a demand for medium wools in Canada, such as are used for underclothing, knitted goods for men's and ladies' under-wear, tweeds, serges, and goods of that description. These wools are superseding, to a certain extent, the similar wools that were formerly imported.

THE LONG WOOLS.

Up to a recent date, it was the long wools and the imported fine wools that were chiefly used. The Cotswold and Leicester wools would not be used for the same description of goods, except in their early growths, before October or the latter end of September. The wool coming afterwards would be for worsted purposes, and our market for it would be either in England or the United States, but principally in the United States.

GOOD PRICES FOR FINE WOOLS.

To Mr. Thomas Stock.—The market is not so brisk in our long wools, but our finer wools from the desirable crosses, are still commanding good fair prices.

[*Mr. Hallam.*]



OXFORD DOWNS.

The first of these is the fact that the United States has a long and rich history of immigration. This has been a major factor in the development of the country, and it has led to the formation of a diverse and multicultural society. The second factor is the fact that the United States has a long and rich history of innovation and invention. This has led to the development of many of the technologies and industries that we know today. The third factor is the fact that the United States has a long and rich history of democracy and freedom. This has led to the development of many of the political and social institutions that we know today.

THE HISTORY OF THE UNITED STATES

The history of the United States is a long and complex one, and it is one that has shaped the world as we know it today. It is a history of struggle and triumph, of hope and despair, and of the pursuit of a better life for all.

The history of the United States is a story of many different people, many different cultures, and many different experiences. It is a story that is still being written, and it is one that we all have a part in.

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LEICESTER WOOL BEFORE COTSWOLD.

To Mr. Dymond.—Previous to the recent change in favour of medium wools, the Leicester wool was more in demand than the Cotswold. The Leicester wool, as I understand it, when manufactured into goods, imparts a lustre to the manufactured article to a greater extent than the Cotswold wool; it is also more even in staple, is not so bulky, and is a better spinning wool for combing purposes. On the whole, I think the fleece of a thoroughbred Cotswold would be heavier than that of the Leicester.

THE SHROPSHIRE DOWN WOOL.

I would rather have the Shropshire for wool than the Cotswold or the Leicester; its wool is of a softer nature, and I believe would command more in the market.

AVERAGE WEIGHT OF THE FLEECE.

The average weight of farmers' wool in Canada is about five pounds to the fleece; the average weight of a Cotswold fleece is about nine pounds; of a Leicester about the same; and of a Lincoln and Shropshire a little less. The Cotswold and Leicester wools predominate in this country; we get very few fleeces of the Lincoln or Shropshires in this part of Canada.

THE SOUTHDOWN THE BEST—COMPARATIVE VALUE.

The Southdown sheep I consider, for wool and for all practical purposes, the best; its fleece weighs from five to seven pounds. As to the comparative value of the fleeces of the different breeds, if I were buying Cotswold fleeces for 28 cents a pound, I would give 33 cents for the Southdown; or if the Cotswolds were bringing 30 cents, I would give 35 for the Southdowns. That is, I would give about five cents, or one sixth, more for a Down fleece than for a Cotswold fleece, according to weight. In the present state of the market I think a cross between the Down and the Leicester or Shropshire would be the most desirable, that is for the Canadian demand.

THE UNITED STATES DEMAND.

In the United States the demand is chiefly for what is called medium long wools for Delaine purposes. There is at present a great objection to the wool of thoroughbreds, on account of its length and coarseness. When I say that there is a demand in the United States for medium wool, I mean the wool from the cross of some fine breed and a thoroughbred, which will give the wool a lustre, and sufficient strength of staple to enable it to comb; a cross of a Leicester and a Southdown, or a Shropshire and a Southdown, is the class of wool which I would advise the farmers of Ontario to raise in preference to any other kind.

MARKET FOR LONG WOOLS ABROAD.

We have no machinery in this country for using the long, heavy wools profitably, and we have to find a market for them abroad.

CAPE AND AUSTRALIAN WOOLS.

The greatest bulk of the wool imported into this country is Cape and Australian wool. There is what we call the ordinary Cape wool and the Blue Cape wool; one is grown to the north and the other to the south, although they are about the same style of wool. They are the produce of the Merino sheep. At the present time we are not able to supply the wool which is desired by a large portion of our manufacturers here; we cannot

[*Mr. Hallam.*]

supply the wool necessary for the manufacture of fine tweeds, and I don't think it is wise for our farmers to try to do so, and no amount of protection would enable them to do so profitably.

AGE OF PROFITABLE FLEECE.

The age at which a fleece is in the best condition is at the first clip; that is what we call lamb or hogget wool. As it becomes older it deteriorates, becomes coarser, and is a different staple altogether.

SELLING LAMBS A MISTAKE.

I think it is a great mistake for our farmers to sell their lambs in the fall; if they would take the first clip, and grow wethers, they would get more for their wool and mutton. The wool increases in quantity until about the third clip, and then it decreases.

FIRST AND SECOND CLIPS BEST.

I would rather have the first and second clips, in point of value, than the second and third; the additional quantity which I would obtain in the latter case would not compensate me for the deterioration in the quality of the wool.

SHEEPSKIN RUGS.

I do not believe there are many sheepskin rugs manufactured in this country. The wool skins used for that purpose depend on the quality of the rugs required. Some years ago the Grand Trunk or the Great Western, or some other Railway, gave an order to a factory down east—I think at Sherbrooke—for a quantity of fine wool railway rugs. The manufacturer produced a fine article, but every rug was made out of the very best Cape or Australian wool, and they were so costly that they soon went out of use. I prefer what we call Leicesters for sheepskin rugs. There are two or three manufactories for dyed rugs in Canada, but they don't amount to much. We send quite a number of our best long-wooled skins to the United States for that purpose. Manufacturers of sheepskin mats and rugs come over from the United States to buy skins, but as they have to pay 50 per cent. duty on raw skins imported into the United States, they destroy the wool on the skin for woollen manufacturing purposes, and partially tan it by dipping it in a solution of alum, and in that way they can import it for 20 per cent. From these skins they manufacture dusters, mats, ornaments for bonnets, and innumerable articles which are very nice and sell well.

CARELESS MANAGEMENT OF SHEEP.

As a rule our farmers do not take enough care of their sheep, consequently the wool is full of seeds, burrs and chaff, which lessens its value one, two or three cents a pound.

To Mr. Edward Stock.—I cannot say which class of sheep produce the most cots. I think the remedy for cots is the hands of the farmers themselves.

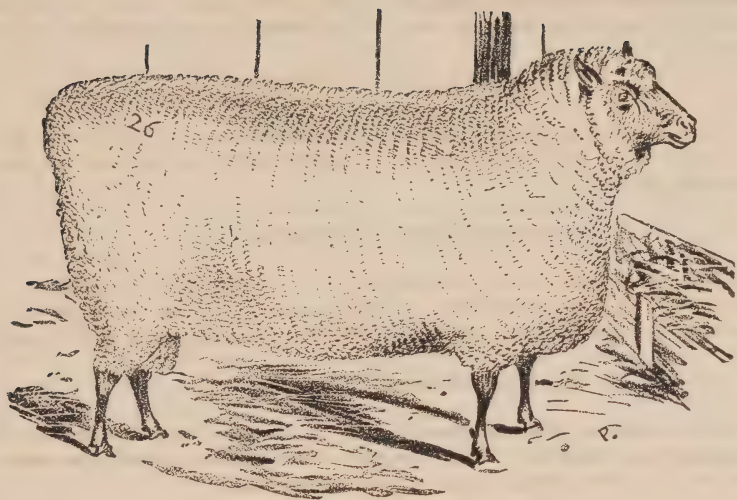
MORE CARE BOTH BEFORE AND AFTER SHEARING NEEDED.

To Mr. Dymond.—The carelessness of farmers with regard to the care of wool applies both to the fleece on the sheep and after it is sheared. There is not sufficient care taken in shearing the fleece and getting the wool into a good marketable condition.

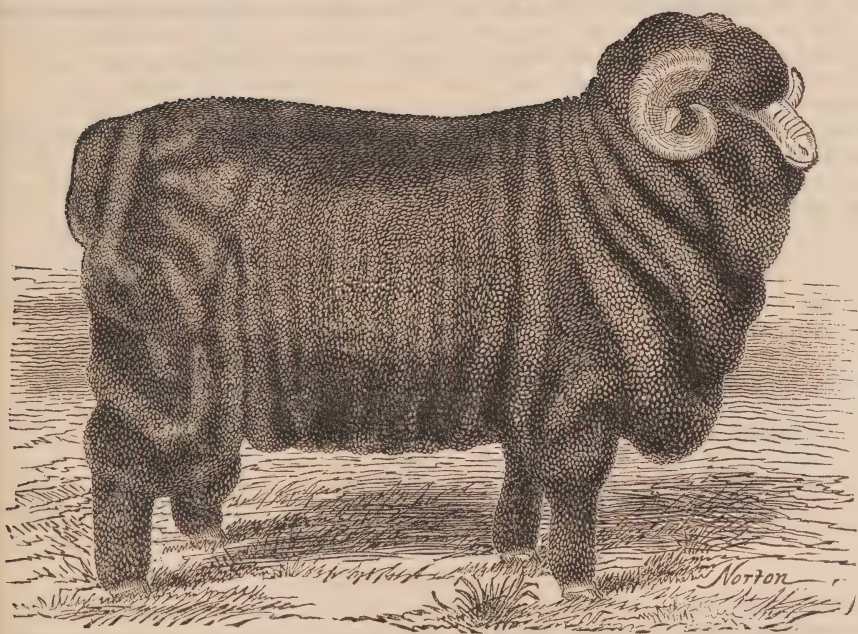
CONTRAST WITH IMPORTED WOOLS.

I import wools from England, Scotland, and Ireland, similar to our lambs' wools, which have not a burr or seed in them. You could not find a seed or burr in 10,000

[*Mr. Hallam.*]



SOUTHDOWN RAM.



MERINO RAM.

pounds of such imported wool, but I would find 10,000 burrs and seeds in the same quantity of wool raised in Canada. That arises from the carelessness of the farmers in keeping their sheep, and in not having proper appliances for keeping burrs and seeds from the sheep. It is simply owing to slovenly farmers.

HEAVY LOSS TO THE FARMER.

In wool there are what are called "rejections," which consist of cots, wool badly washed, wool with seed in it, wool with chaff in it, and wool with burrs in it; and about 20 per cent. of the wool that we get in Canada consists of rejections, while, if care were taken, there would not be two per cent. of rejections, as is the case in English wool.

COARSE GOODS—CARPETS.

We sell this rejected wool to the manufacturers as poor wool, and they make blankets, etoffs, coarse tweeds, and kindred kinds of cloth from it. We do not manufacture carpets from wool to any extent in this country; the wool we grow in this country, except the rejected, is too good for that purpose. I could get a wool from Persia and India that would be more suitable for carpets at a cheaper rate. All the white portions of tapestry carpet are composed of the very best wool that can be got.

SCOTCH WOOL—ENGLISH LAMBS' WOOL.

The wool I buy in Scotland is almost the same as that bought here; I buy it, because it is free from all those foreign elements which are so objectionable to the manufacturer. Last week I bought 8,000 pounds of English lambs' wool, and I gave 32 cents a pound for it, delivered here; for our own wool, I would give 29 or 30 cents—that is, about 10 per cent less. We sort the wool into lamb, superb, number one, and chaffy, and burry, and it ranges from 4 cents up to 29 and 32 cents a pound, and the reason Canadian farmers do not get the highest price for their wool is just owing to slovenly farming.

MORE MEDIUM WOOL WANTED—GERMAN WOOL.

To Mr. Thomas Stock.—We require a great deal more medium wool in this country. Five weeks ago I bought 50,000 pounds of German wool, which is similar to our South-down wool, but a little more tender, soft, and bulky. What we need in this country is a fine, bulky wool—not a heavy, dead one. Some blankets have a heavy, dead, weight, while others have a nice puffiness and elasticity about them, commonly called loftiness. We get that from the crosses which I have described; and this German wool is very superior in that respect, and is very clean and pure. I bought it for 32 cents a pound, about the same price as that of the Scotch wool.

SUPPLY OF CANADIAN WOOL DEFICIENT.

We cannot get a sufficient supply of wool in Canada, and so we have to import. I buy wool from the farmers in Ontario through my customers in various parts of the country, in the various cities and towns. We say to a man in a good wool centre, like the country around London, St. Thomas, or Chatham, "You buy the wool at your own risk, and we will take it from you at the market price;" and we never fail to take the wool off their hands. The farmers about Toronto bring the wool and sell it to me direct.

THE OLD CANADIAN SHEEP.

To Mr. Brown.—When I speak of the old Canadian sheep, I refer to the old stamp, such as we find around Kingston and the older settlements of the Province. I do not know whether they have Cotswold blood in them or not. I prefer to give five cents a

[*Mr. Hallam.*]

pound more for Southdown or true cross wool than for Cotswold, Leicester, or Lincoln—I mean the wool of any of the thoroughbred long woolled sheep. We still class wools short medium and long medium.

STRENGTH AS WELL AS LENGTH OF STAPLE.

In buying, we consider not only the length of the staple, but the strength of the staple as well; there are many wools that we class as medium, though long, because they are tender. All our Canadian manufacturers who use Canadian wools prefer not the strong or long staple, but the medium staple.

GOOD FARMERS RAISING GOOD WOOL.

I cannot say whether the want of lustre in the Canadian wool is owing to the want of breeding or the want of management; but I have always found that good farmers, who feed their sheep well, have good lustre wool. There is no lustre on the wool of the old Canadian sheep—it has what we call demy lustre. The first and second clips of wool are the most valuable for manufacturers, and will fetch the most money, and I think it is a great mistake for farmers to sell off their lambs as they do in this country.

INFLUENCE OF BREEDING ON FLEECE.

The average weight of the fleeces we get from farmers who pay no attention to breeding is about five pounds, from those who pay some attention to breeding six or seven pounds, and from those who follow fancy breeding nine or ten pounds. We buy unwashed wools, but we take about one-third off the price when wools are unwashed.

WESTERN WOOL PREFERRED.

I prefer the western wool; I would rather have the wool from the north shore of Lake Erie—about London, St. Thomas, Chatham, and even down to Woodstock and Ingersoll, than the wool from about Bowmanville, Whitby, and other places east. I would knock off one-third of the price for unwashed western wool, and one-half for unwashed eastern wool. Our Canadian wool is washed as well as Scotch wool, but the former is all more or less seedy, chaffy, and burry.

JOHN HALLAM.

Sittings to take oral evidence, held at Almonte, October 13th, 1880. *Present*—Mr. BYRNE (Chairman), and Mr. DYMOND.

MR. ANDREW ELLIOTT'S EVIDENCE.

ANDREW ELLIOTT, of Almonte, woollen manufacturer, was called and examined.

To Mr. Dymond.—I am a member of the firm of Elliott, Shirreff & Co. We make tweeds.

TWEEDS—IMPORTED WOOLS.

We use chiefly Cape, Australian, and South American wools, and we have had some from New Zealand, all fine, short, staple clothing wools.

MERINO WOOLS.

We have occasionally tried merino wool from the States, but it is coarser and dearer. It is raised in the State of New York. It does not make such goods as we are now manufacturing.

NO SUPPLY IN CANADA.—THE COARSE, LONG WOOLS.

We are not able to obtain a supply of the wool we require in Canada. The coarser and longer wools have been chiefly grown in Canada. In western Ontario I used to manufacture the home-grown wools into coarse tweeds and blankets, and some flannels.

[*Mr. Elliott.*]

WORSTED GOODS.

There are no mills for making worsted goods in Canada at present, but Mr. Rosamond is building one. That will be supplied chiefly by Australian wool. Some Leicester wool will be required.

DEMAND FOR THE COARSE WOOLS.

There is a good demand in Canada still for the coarser wools. All the small local mills and some of the larger ones, such as the Cornwall, use a great deal of Canada coarse wools. Our coarse wools are also largely exported.

SOUTHDOWN NOT FINE ENOUGH.

Southdown wool would not be fine enough for us, and if crossed with the Leicester would be still coarser. The medium wool produced by a cross from the Southdown on the common stock would be used for a medium class of tweeds. The demand for these has not at present been very large.

RECENT DEMAND FOR SCOTCH CHEVIOTS.

There has of late been a demand for what we know as Scotch cheviots, which has absorbed a good deal of medium wool. They are a class of goods without much finish. The continuance of the demand is a matter of uncertainty. We buy none of this wool and so cannot say anything as to its price.

COMMON CANADIAN FOR LUSTRE.

For a lustre no wool is better than the common Canadian wool, but the quantity required by us is very small.

ANDREW ELLIOTT.

LETTER FROM MR. BENNETT ROSAMOND.

ROSAMOND WOOLLEN COMPANY,

ALMONTE, Ont.; 26th October, 1880.

A. H. DYMOND, Esq.,
Ontario Agricultural Commission,
Parliament Buildings, Toronto.

Dear Sir:—Yours of yesterday to hand. We use only a very limited quantity of Canadian wool, and that not by itself but in combination with fine wools to produce certain effects.

SHORT SUPPLY OF SUITABLE WOOL.

However, even that limited quantity we have great difficulty in procuring of the proper quality. The great bulk of the wool grown in Canada seems to be suitable for only the very roughest and coarsest of tweeds, a fact hardly creditable, one would think, to the judgment of our wool growers, and one which has, in my opinion, seriously interfered with their profit.

MEDIUM WOOLS IN DEMAND.

We, in common, I have no doubt, with nine-tenths of Canadian wool manufacturers, would be glad to use a large proportion of native wool, could we only get it of suitable quality, neither too fine on the one hand, such as merino, nor too coarse and long on the other, such as Leicester and Cotswold.

[Mr. Rosamond.]

RELATIVELY HIGHER PRICES.

Medium wools everywhere, at home as well as abroad, are in greater demand, and relatively bring a higher price than finer wools, and besides are more easily grown in Canada, and quite as easily, if I am correctly informed, as are the longer and coarser sorts.

WOOLS OF A SOUTHDOWN CLASS.

I feel very confident, did our farmers turn their attention more to wools of a South-down character, the benefit to the country would be greater than most people have any idea of. Our Canadian manufacturers would then have the benefit of a class of wool now at all times difficult to procure, and would be able to produce better and more saleable goods, really Canadian, than they now can do, and the money sent out of the country for such wools would be, instead, distributed among our own people.

I am very glad indeed to learn that your Commission is giving this matter careful attention, and hope your labours may be productive of good results.

Yours very truly,

B. ROSAMOND.

PORK PACKING.

Sittings to take oral evidence held at Toronto, August 17th, 1880. *Present*—Messrs. HILBORN (Chairman), and DYMOND.

MR. WILLIAM DAVIES' EVIDENCE.

WILLIAM DAVIES, of the firm of William Davies & Co., Toronto, was called and examined.

CHIEF SUPPLY OF HOGS.

To Mr. Dymond.—I have been largely engaged in the pork-packing business in Canada for twenty-five years. My chief supply of hogs is obtained from the Western States; Canada does not furnish nearly enough, and I find it necessary to go there to obtain a sufficient supply. So much has that been the case with other pork-packers, that several large Liverpool houses represented here had to remove to Chicago.

A LARGE BUSINESS.

At the present time mine is the largest business of the kind in Canada. We killed over 50,000 hogs last year between the first of May and the first of May. We kill all year round, more or less.

CHARACTER OF THE TRADE.

Our pork is packed almost exclusively for shipment to England. The pork used by the lumbermen is packed for the most part in barrels, and is known as mess pork. Ours is put up almost entirely in the shape of bacon and hams. Pork-packing is the comprehensive name of my business in American parlance, but it is really bacon-curing. I sell scarcely any mess pork; we put the whole hog into bacon—hams and sides. The portion that will not pack, such as the heads, is melted into grease or lard, and the latter is shipped.

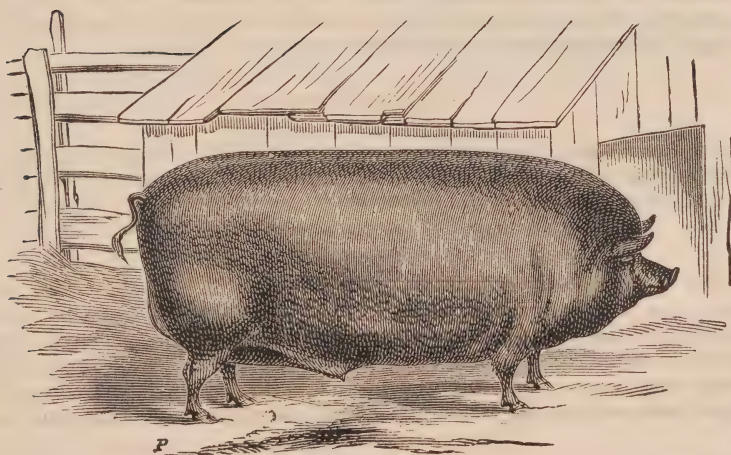
[*Mr. Davies.*]



POLAND CHINA.



THE "RACER" OR "ALLIGATOR" FIG.



ESSEX BOAR.

CLASS OF HOGS REQUIRED.

The class of animals I require are hogs ranging from 160 to 240 pounds, live weight—and we must have them alive. We do not buy dressed hogs at all. We consider it very bad economy to do so, because we can kill and cut up a pig in a great deal less time than a farmer, besides making much better work of it.

LEAN BUT WELL FED.

The kind of hog we desire is a lean hog; but I would here guard against the idea that we require a thin hog. While we want it lean, we want it well fed; a great deal of fat, instead of being an advantage, is a great disadvantage. We like a long hog, or, as a prominent English packer described it recently in a Chicago paper, something like the old racer breed crossed with the Berkshire.

THE RACER BREED.

When I speak of racers, I mean the common Canadian hog with a long snout and long legs, somewhat modified. The common Canadian hog, crossed with the Berkshire, would, I think, be about the kind of animal required for the English market. In short, what we want is a meaty hog, but not a fat hog.

HEAVY WESTERN HOGS NOT SUITABLE.

To Mr. Hilborn.—The heavy western hogs, which are very fat, would not suit our purpose. There is a kind of bacon used in Canada known as "long clear," from which all the bone has been taken, and it is desirable that that should be thick and fat; but even for that purpose, a long pig is more desirable than one with a short body.

LONDON AND LIVERPOOL MARKETS.

The markets supplied by me, for which the kind of pork I have described is required, are the London and Liverpool markets for city consumption; but the country requirements in England now are very similar to those of the city. Since the farm labourers have become better off, they will not eat chunks of fat as they used to.

CHANGE IN THE DEMAND.

To Mr. Dymond.—There has been a very great change in the demand for pork in England in recent years, which I attribute to the improved condition of the working classes. An ordinary Englishman now wants his meat mixed, and not a mere chunk of fat to flavour his bread with.

DIFFERENCE IN VALUE.

To Mr. Hilborn.—Pork fatted in the manner which I have described is worth more than that fatted in the ordinary way. In fact, we won't buy heavy hogs if they are brought to us. We want them as small-boned as they can be made, so long as they are long and fleshy, and such animals are to be found.

INFERIOR HOGS.

Many hogs in Canada are killed when they are not more than half fat; they are not merely thin on the back, but the belly, the prime part, is almost like a sheet of paper. This, I am told, is owing to the farmers letting their hogs run adrift as soon as they leave their mother, and get their living on the roadside. They are then shut up and hastily fed, and then they are knocked on the head.

[*Mr. Davies.*]

FEEDING FROM EARLIEST DAYS NEEDFUL.

It is my opinion, as well as the opinion of those of more experience, that hogs, like any other animals, should be fed well from their earliest days. At the present time we would give fifty cents per hundred pounds more for good medium hogs than for large, fat hogs.

DISPOSAL OF FAT HOGS.

In fact, we would not buy the large hogs at all in the present condition of the market. Those who buy them only handle them during the winter, and pack them for the lumbermen. We handle hogs all the year round. We find no difficulty is securing a supply from the Western States in the summer.

ATTENTION TO HOG BREEDING IN THE STATES.

To Mr. Dymond.—They pay more attention to the breed of hogs in the Western States than is generally done in Canada, and it is therefore comparatively easy for us to buy there any reasonable quantity of hogs of a uniform weight.

CANADIAN FARMERS' HOGS.

I think Canadian farmers are behind western farmers in the care of their stock. The sows are not spayed. Many farmers imagine that it is economy to get a litter of pigs from a young sow before they fatten them, so we get some young sows which have had pigs, and others are in pig, which diminishes their value very much. Many barrows, too, have not been castrated until very late in life.

BREEDING PIGS OBJECTED TO.

To Mr. Hilborn.—I think the females should be spayed if they are not to be bred from. They fatten much more readily, and are more valuable to the curer. The flesh of a sow that has had young, or of a boar that has run as a boar until it is six or eight months old, is coarse and strong. It makes a sow's belly thin to have young.

THICK BELLIES AS WELL AS THICK BACKS.

We want pigs with the belly as thick as the back. The practice of spaying sows is very generally resorted to in the United States, but not so much in Canada.

PIGS AT NINE MONTHS—THE MARKETS.

We should like to get pigs about nine months old. We give as much for a Canadian sow that has not been spayed as for an American one that has; we have to get them as cheaply as we can. Our price is not regulated by the price in Chicago, though it is governed by it to some extent, of course. Our bacon is generally two or three weeks in our cellar before it is shipped. I cannot tell what we get for it in Liverpool, because the fluctuations are very great.

SUPPLY REGULATING PRICES.

To Mr. Dymond.—Sometimes we give more for Canadian pigs and sometimes less than for western American pigs. The supply guides us in that respect. If we can get the right breed of pigs which are also free from stags, and just such as to suit our purpose, we are willing to pay the highest price for them, even more than we do for Chicago hogs laid down here. But of course if the supply is large here, we get them as cheaply as we can.

[*Mr. Davies.*]



LARGE ENGLISH WHITE BREED.

CANADIAN HOGS BEST IF PROPERLY FED.

Canadian hogs are a good deal better than western hogs, if they are fed just as well; because Canadian hogs are fed on peas and barley, which make the fat firmer and produce more flesh, while American hogs, which are fed on corn, have a less firm fat and a smaller quantity of flesh; but the American hogs are much superior to the Canadian hogs in regard to their body being uniform. The Canadian pork is rather primer meat, as it consists more of lean flesh and less of fat.

PRESENT PRICES.

At present we are paying from five to five and a quarter cents a pound for Canadian hogs; that is more than we have been paying formerly. Of the hogs we want, we do not get more in Canada than about 3,000.

WESTERN ONTARIO HOGS.

Some of them come from as far west as London, St. Thomas, and Chatham. Those from the latter places are much more like the American hogs than most Canadian hogs, which I account for by their being fed on corn and being much better bred. A great many hogs from that part of the country are pure-bred.

HOG FEEDING PROFITABLE.

I think hog feeding, within certain limits, is a very profitable business for the farmer.

FACTORY-FED HOGS.

I have had experience of the hogs raised at the butter and cheese factories of the country. We buy them largely and like them well. We usually buy them from the drovers, who buy them from the factories. We have bought direct of Mr. Ballantyne, of Perth, and Mr. Richardson, of St. George. Factory-fed pork, if also fed on grain, is superior to farmer's pork. I do not approve of feeding them on whey without grain; I think it unnatural.

DISTILLERY FED PORK.

I do not consider distillery-fed pork so good as pork fed by farmers; the fat and lean are both softer. I have an impression that the pork fed at the distilleries is principally sold in Montreal, where the French Canadians eat a great deal of fresh, fat pork all the year round.

PEAS—BARLEY—MIXED FEED.

I think peas and barley make the best quality of pork. Mixed feed, such as potatoes boiled, and milk, etc., makes the finest pork.

IRISH HOGS.

We can never hope to compete successfully against the Irish pork, partly because it is so near the market, and partly because the hogs in Ireland are fed and bred with great care. They have contrived there to get the hog as thick in the belly as in the back; but I should suppose that it would not be difficult to breed so as to obtain that perfection. I do not know the process of feeding hogs in Ireland; but I have been told they are fed on oatmeal, barley meal, potatoes and milk, boiled together. Certain it is, that the fat of Irish pork is rich and luscious—not oily, as on this side of the Atlantic.

[Mr. Davies.]

REPUTATION IN ENGLAND.

My pork is sold in England as Davies' pork from Toronto. I cannot tell whether it is sold there as Canadian or American pork. I think we are in the first rank of pork-packers. We command the highest prices.

FARM KILLED HOGS.

I think Canadian farmers stand in their own light in killing their own hogs—certainly those do who live at a great distance from Toronto. When the farmers kill their own hogs, a great deal of the inside which we can utilize by killing a large number together is comparatively wasted.

DAMAGE TO FROZEN HOGS.

The hogs are frozen, and they are taken to the country stores and piled up like cordwood, and gnawed by hogs, dogs, cats, and rats. They are covered with dust and dirt, are pitched about with not much more care than cordwood, are kept in a country warehouse for two or three weeks, sometimes months, and are then brought here by railway, and by the time they reach us, they are more like carrion than human food. If the pigs were killed here, every part of them could be kept bright and fresh and good. I don't know what the drovers pay to the farmers, but we often pay almost as much for live hogs per pound as dressed hogs fetch on the market in the winter.

KILLING ON THE FARM IMPOLITIC.

To Mr. Hilborn.—If a farmer keeps his hogs alive, he can time his sales and choose his customers. If a number of neighbouring farmers have not enough each to make a shipment, they may club together and bring their hogs to Toronto. It seems to me a great pity that a valuable animal should be comparatively ruined by being killed a hundred miles from where it is to be cut up and converted into bacon.

SELLING HOGS ALIVE.

In the northern part of the county of York, the farmers have sold their hogs alive for years, and I think they are much more pleased with that practice than the old process of killing them before taking them to market. They are bought up from them by drovers, and shipped.

WILLING TO GIVE A GOOD PRICE.

If I could get a steady supply of Canadian hogs from year's end to year's end, even two or three hundred per week, I would be quite willing to give considerably more for them than for American hogs.

SALT IN CURING.

To Mr. Dymond.—We use a large quantity of salt in our business—something like 200 or 300 tons annually. We use Liverpool salt, which we buy in Montreal by the car load.

STOVED SALT—COMMON LIVERPOOL SALT.

We use two kinds—stoved salt, and the common Liverpool salt—we do not trouble much about the brand. We mix the fine and coarse together for salting. We prefer the stoved salt because it is so dry, but the coarse salt is much the cheaper, and we use the coarse salt as an alloy for the fine stoved. The dryer the salt is, the better it is for our business. The large crystal salt is better for mess pork, but we prefer a fine salt for bacon packing.

[*Mr. Davies.*]

CANADIAN SALT—A SERIOUS COMPLAINT.

We have tried Canadian salt two or three times. Some three or four years ago it nearly ruined me. The bacon salted with it was injured very seriously. It became slimy, and the more we used the worse it became, and on ceasing to use Canadian salt and taking the Liverpool again, we had no more trouble.

A RECENT TRIAL.

I tried the Canadian salt again last fall. I had used it in one or two previous winters, and got along with it pretty well in the winter; but it does not suit at all in the summer. We used it again last spring or early summer, but we could not get any dry, and I found that a sort of fungus was forming on the bacon.

PROBABLE CAUSE OF THE TROUBLE.

I think very possibly the trouble with Canadian salt has arisen from its being wet. To the best of my knowledge we never had any that was dry enough, but I think that of which we had most reason to complain was purchased in the spring. Whenever I gave my order, I got the salt and used it immediately. We do not keep more than twenty or thirty tons of salt in the store at once. I have had Canadian salt both from Seaforth and from Goderich. When I ordered it I particularly asked on several occasions that it should be sent dry.

CANADIAN SALT BELIEVED TO BE PURE.

To Mr. Hilborn.—I am not aware of the Canadian salt containing any substance deleterious to the bacon. I am not a chemist. I am not very sure whether I had any analysis made of the Canadian salt or not. What purports to be an analysis of the salt would indicate that it is very pure, and I am willing to believe that if it was thoroughly dried it would answer my purpose, and I am willing to try it if the salt manufacturers dry it; but I am not willing to take wet salt simply because it is made by Canadians.

STAPLETON SALT.

To Mr. Dymond.—I don't know anything about Ransford's Stapleton factory-filled salt. We salt the meat to eliminate water in the meat, and therefore we do not want to add any moisture.

CANADIAN SALT CHEAPEST.

Canadian salt can be laid down in Toronto at a very much less price than the Liverpool salt. Canadian salt comes loose in the cars, but Liverpool salt comes in bags. Canadian coarse salt, delivered in Toronto, costs 23 cents per cwt., and Liverpool common salt costs 26 cents per cwt. I use about one-third the quantity of Liverpool common salt that I do of the fine stoved salt, which costs 42 cents per cwt., after deducting the value of the bags. Liverpool fine salt, therefore, costs nearly double as much as Canadian coarse salt, though Canadian fine is sold at 23 cents. Canadian fine salt is not so fine as the Liverpool fine.

FINE DRY SALT INDISPENSABLE.

It would answer for curing if it were dry, but not for packing in boxes. Fine, dry salt makes the meat look much handsomer and more pleasing to the eye when it is unpacked than coarse salt. I want a salt for my purpose much finer than that known as Canadian fine, and perfectly dry. For a trial of it, I would give the same price as I do

[*Mr. Davies.*]

for the Liverpool salt, and after that of course the price would be regulated by supply and demand. I would be willing to give from \$7 to \$8 a ton for Canadian salt if it were equal in quality to the Liverpool fine stoved salt.

SUFFOLK AND ESSEX HOGS.

The Suffolk and Essex breed of hogs have done great injury to the pork-packers. I cannot say whether they are profitable to farmers in being very apt to take on fat and arrive at early maturity, but they are so short and thick there is very little prime meat in them. They consist of little besides hams and shoulders, which are very thick and fat.

BERKSHIRES AND YORKSHIRES.

The Berkshires and Yorkshires are long in the body, and the latter are very fleshy. They are rather coarse, but I should think crossed with a smaller breed they would be well adapted for any purpose.

A LONG PIG WANTED.

A long pig is more suitable for any purpose than a short one, whether for the English market or for local use, for barrel pork or for bacon, because, as I remarked before, in the former there is lots of prime meat between the shoulder and ham.

WILLIAM DAVIES.

Sitting to take oral evidence, held at Seaforth, August 12th, 1880. *Present*—Messrs. McMILLAN (Chairman), and DYMOND.

MR. BEATTIE'S EVIDENCE.

JOHN BEATTIE, Mayor of Seaforth, was called and examined.

To Mr. Dymond.—I was engaged in the pork-packing business in the winters of 1878 and 1879. I am now engaged chiefly in flax raising. I have a hundred acre farm, but I do not do much at farming. During the two years that I was engaged in pork-packing, I used Canadian salt exclusively.

EXPERIENCE WITH CANADIAN SALT.

I had heard that Canadian salt would not cure meat, but I don't believe any man can tell the difference between meat cured with Canadian salt and that cured with English salt.

SALT MUST BE DRY.

There is one thing, however, that is essential in the salt; it must be dry, all the water must be out of it. My packing was done from the beginning of November to the spring. Once, when we got green salt, it had a slimy effect on the meat, and we were obliged to wash the meat and salt it over again. There was nothing wrong in the salt except the greenness of it.

NO TROUBLE WITH DRY SALT.

After that, we got dry salt and had no trouble with it. During the two seasons that I was packing, I had no spoiled meat at all, and no complaints from shippers. I am very strongly of opinion that there is no fault to be found with Canadian salt if it is put up in proper shape.

[*Mr. Beattie.*]

THE KIND OF HOGS PREFERRED.

To Mr. McMillan.—When the salt was dry our meat turned out entirely satisfactory. The hogs we preferred were those weighing about 150 or 200 pounds dressed. If a person could get a sufficient number of hogs of that weight, he would do better than with a heavier article. For every order for hams weighing from 14 to 16 pounds, we usually got ten for those weighing from 8 to 12 pounds. I think it is a mistake for our farmers to go into the raising of hogs of large size.

HOGS FOR THE ENGLISH MARKET.

It pays packers very well to get the fat meat, but you cannot sell it so well in the English market; a lean ham and a lean side are what are in demand there. For the lumbermen, coarse, fat meat is better. I think the hogs raised in Canada are as well adapted for the lumbermen as western hogs.

JOHN BEATTIE.

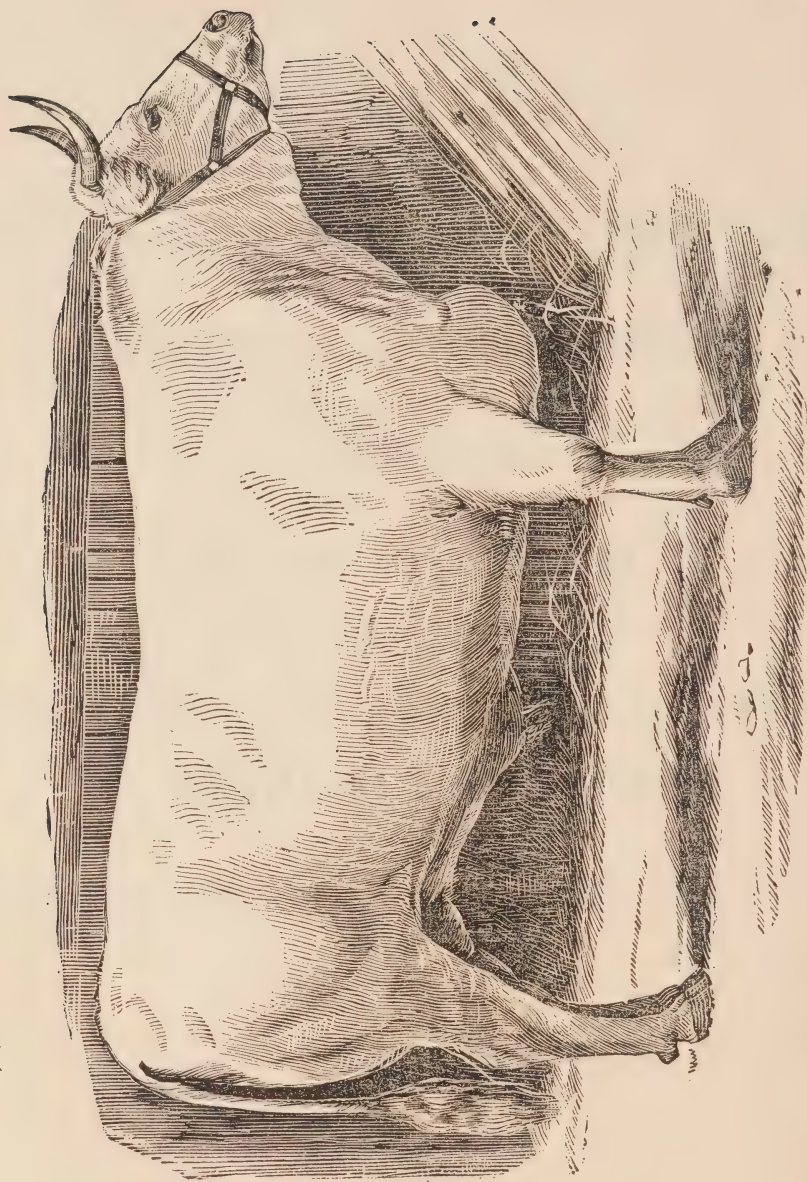
ONTARIO AGRICULTURAL COMMISSION.

APPENDIX I.

EVIDENCE

RELATING TO

**GRAZING, FEEDING, AND SHIPPING
CATTLE AND SHEEP.**



GREAT "DOMINION CHAMPION" SHORTHORN STEER—WEIGHT 2,900 LBS.

ONTARIO AGRICULTURAL COMMISSION.

APPENDIX I.

EVIDENCE

RELATING TO

GRAZING, FEEDING, AND SHIPPING CATTLE AND SHEEP.

Sitting to take oral evidence held at Toronto, June 23, 1880. *Present*—Mr. MALCOLM (Chairman), Hon. S. C. WOOD, and Messrs. GIBSON, DYMOND, WISER, M.P., BALLANTYNE, M.P.P., T. STOCK, WHITELAW, McMILLAN, WILSON and BYRNE.

MR. E. B. MORGAN'S EVIDENCE.

E. B. MORGAN, of Oshawa, was called and examined.

THE CATTLE SHIPPING TRADE.

To Mr. Malcolm—I am a shipper of cattle. I have been engaged in that business about three years. I buy cattle from farmers and on the markets to supply the British demand.

NONE BUT THE DURHAM.

For that market I would recommend farmers to produce nothing but the Durham. There are some differences in the quality and value of different families of this breed. We prefer the fine boned heavy fleshed animal to the heavy boned animal. I think the market in Britain for Canadian cattle will increase as soon as the industries of Great Britain get agoing again. The English consumption of our cattle is now 25 or 30 per cent. less than it was two or three years ago.

SUPPLY OF CATTLE DEFICIENT.

At this time of the year we cannot obtain a supply sufficient for the British market, and we shall not be able to do so until the winter. That is a misfortune to this country, and I would recommend to farmers to have a good supply of cattle all the year round. It is a great mistake for the farmers to have their cattle all come at the same time, because it not only gluts the English market at one period, but prevents them from keeping up a regular supply.

[*Mr. Morgan.*]

FOUR-YEAR-OLDS BEST TO SHIP.

Four-year old steers are the best to ship, but a great many good cattle are shipped from three years old upwards. No cattle weighing less than 1,300 pounds should be shipped; the best weights for the English market are from 1,300 to 1,600 pounds. We have sent fine animals weighing as much as 1,800 or 2,000 pounds, but they are not wanted by the butchers so much as those I have mentioned.

BEST TIME FOR SHIPPING—FIRST CROSSES.

The most profitable period for shipment is during the months of May and June. One cross on our native stock, provided the sire is a thoroughbred animal, will produce a very good grade. The higher the breed of the bull, the greater will be the impressiveness on the calf, and consequently the better will be the beast produced.

PASTURE-FED CATTLE OBJECTED TO.

I don't think it is profitable to ship cattle which have been fed on grass. The grass just puffs them up, and makes them look very nice when they leave here, but they can't stand the journey; they must have grain. The difference in the shrinkage between grass fed and grain fed animals is 25 per cent.

WHERE THE BEST CATTLE ARE RAISED.

Anywhere west of Belleville I find the most suitable cattle for shipment. In the county in which I live—the county of Ontario—I believe there are to be found the best cattle anywhere in the Province. There is 50 per cent. difference in the value of a common grade steer and that of a well bred steer; in fact, I would not ship a common bred animal at all, if I could help it. It is of no use to ship a poor animal to England.

MIXED FEEDING.

To Mr. McMillan—I think cattle might be profitably fed on grain along with grass. A three-year-old steer, if he is in pretty good flesh before he goes upon grass, will do very well upon it if he gets a gallon of corn or pea meal a day, with a little linseed cake.

COMMON STOCK NOT PROFITABLE.

To Mr. Byrne—I have shipped native stock. I did not find it profitable to ship them, even under the best circumstances. I would rather pay six cents a pound for a well bred animal than four cents for a common animal of equal fatness. You require style and quality combined for the English market. The texture of the beef is better, the fat and lean are more mixed up, and the bone is smaller in a well bred animal than in a common one.

SHIPMENTS OF SHEEP—WHAT IS WANTED.

To Mr. Whitelaw—I have shipped some sheep to the old country. The weight preferred there is 150 pounds live weight; that will make the carcass from 70 to 75 pounds. About eighteen months to two years is the proper age for shipment.

VALUE OF THE "BLACK FACES"—WETHERS.

In England they prefer the black-faced sheep. I would give two cents a pound more for a good cargo of good black-faced sheep than for other kinds. The Southdown, Shropshire, and Oxford Downs are the best. There is a penny to twopence a pound difference
[*Mr. Morgan.*]

between the value of wethers and ewes in England ; that is equal to a cent and a half a pound here, live weight. There is a difference of two cents a pound in the price paid here for wethers over that paid for common ewes. You can ship nothing better to England than a good Southdown or Shropshire or Oxford Down wether. The English butchers, when they kill a Down sheep, leave the skin on the legs, so as to convince their customers that they are selling them Down mutton.

WEIGHT OBTAINABLE AT THREE YEARS.

To Mr. Dymond—It is difficult to get cattle at three years old, weighing from 1,800 to 2,000 pounds. There is no difficulty with proper management, in attaining 1,400 or 1,500 pounds weight at three years old.

GRAIN, GRASS, AND SWILL FED CATTLE.

I have bred cattle. Grain fed cattle are mostly shipped at the present day ; but I am now shipping grass fed cattle, because it is difficult to get others. There are a good many swill fed cattle, but they are not popular in the market. They are the best shippers to stand the sea voyage we have got, I think. I don't know how to account for it, unless it is because they have been used to close confinement, and have the same facilities on the ship for feeding as they have been accustomed to. I think it is much better to tie up cattle while on ship-board. I have bought some common cattle for the English market for 4 cents a pound ; for grade steers such as I have mentioned I have given as much as 6½ cents.

FACILITIES FOR SHIPPING.

I have no difficulty in the matter of freights ; there are plenty of freights offering. I have shipped from Montreal, Halifax, Portland and Boston. Montreal has the best accommodation of any port in America. We had to pay too high rates in the spring of this year, but now that the cattle supply is becoming exhausted, ship owners are offering lower rates. Not being able to get the cattle shipped fast enough at Montreal, we had to fall back sometimes on American ports. We had the cattle bonded through. The customs authorities of the United States did not offer any difficulty ; they were very glad to have us use their ports.

COTTON CAKE.

Cotton cake is largely used as a cattle feed in England, but not so largely here. It is not so strong a feed, they say, as linseed. It is liked very well in England for dairy cattle. I have had no experience of it.

THE SOUTHDOWN.

The Southdown sheep is the finest of the Downs. When dressed it weighs as high as 80 or 90 pounds ; about 80 pounds is the popular weight. The price of shipment is per animal ; a heavy one can be sent at the same rate as a light one.

THE OXFORD DOWNS—LEICESTERS.

I have had no experience with the Oxford Downs, but I know they are very popular in England. They are larger than the Southdown, and their fat is well mixed with the lean. The objection to the Leicester sheep is that they run too much to fat. I have shipped Cotswolds, but the objection to them is that they do not come soon enough to maturity ; they do not mature till they are about three years old, while the Southdown or Shropshire matures at a much earlier age.

[*Mr. Morgan.*]

SHROPSHIRE AND LEICESTER CROSS.

A good Leicester sheep is a good sheep for the English market, but it is better to be crossed with the Down as the meat is mixed better in a cross of this kind. A Shropshire Down male and a Leicester ewe would make a splendid sheep for the English market; you could not have a better, because in that sheep you would have size and quality combined.

USING THE DOWNS TO IMPROVE THE NATIVES.

Our farmers should import more Down sheep than they do, and breed from them. If they would import Oxford and Shropshire Down bucks, and cross them with the common sheep of this country, they would not only greatly improve the wool both in weight and quality, but they would have a splendid sheep to ship to England. I would rather have a sheep of good quality weighing 150 pounds than one of coarse quality weighing 200 pounds. I would give seven cents a pound, live weight, for good black-faced wethers on this side now.

ENCOURAGEMENT TO THE BLACK-FACES.

To Mr. Malcolm.—In order to encourage the breeding of black-faced sheep, I think the Agricultural Societies should increase their prizes for them. I know the Cotswolds are more popular among the Americans at present; they are only bred in Canada for the Americans, who buy them for their wool.

PRIZES FOR CATTLE.

I think it would be desirable to continue giving prizes for other cattle besides the Durham, but I would give the Durham the preference. The Hereford, the Devon, and the Polled Angus are all good cattle. I have shipped only a few Polled Anguses. I like them very well. They command good prices in England—I don't know but better prices than the Durhams; but there is nothing liked better in England than a good Durham beast.

DEVON BEEF.

To Mr. Wiser.—The reason I advocate the giving of prizes for Devons is because of the fine quality of their beef. There is about the same difference between Durham and Devon beef that there is between Cotswold and Southdown mutton. It is a hard matter to get a good Devon weighing more than 1,200 or 1,300 pounds. You would have to pay a great deal more freight on them, and you would not get any greater price for them in England.

DURHAMS AND DEVONS.

If you take a thoroughbred Devon and a thoroughbred Durham and feed them the same until they are three years old you will find 300 pounds more beef on the Durham than on the Devon, and you will get that extra beef carried free to England. If you could get hold of good Devon steers and heifers together I think, perhaps, they would command a little better price.

To the Chairman.—I do not think Devons ever will become so popular that we could get shipments of them. They will never become so popular as the Durhams, though they are a nice breed of cattle.

To Mr. McMillan.—If I were going on a large farm and breeding cattle, I would breed the Durham.

E. B. MORGAN.

[*Mr. Morgan.*]

MR. JAMES BRITTON'S EVIDENCE

JAMES BRITTON, Toronto, was called and examined.

FORMER TRADE WITH THE STATES.

To Mr. Dymond.—I am a large buyer of cattle in this neighbourhood. I have been buying for about twenty-five years from the farmers of Ontario. The trade with Great Britain has engaged my attention for about five years. It was on a small scale at first, but the last few years it has increased very rapidly. Previous to that my purchases were for the home market. I also used to feed a great many cattle, and at that time we used to look to the American markets to get rid of our great surplus in April and May. I fed two thousand head one year; that was when we had the treaty with the United States, and our surplus went there. We made a fair profit then, but when they did away with the treaty a sort of despondency took hold of both farmers and feeders. We had a great surplus, and we saw actual loss ahead of us, for we did not know for two or three years what we were to do with our cattle. The price went down from 5 cents to 3, 3½ and 3¾ cents.

RECIPROCITY TREATY—GRADE DURHAMS.

The treaty terminated in 1866. Previous to its termination we found a disposition among farmers to improve their stock, for the same class of cattle were sought for in New York and Boston as in England. There were a great many inferior cattle shipped to the United States, the same as to-day. Those sent there were generally a cross between our grades and Durham stock. They are the best for shipment as they have more bone than others and can stand the fatigue of being on their feet on the voyage better. On the cars they stand on their feet in one position, and if one lies down it is either destroyed or it becomes a mass of putrid flesh.

IMPROVED CARS NEEDED.

It would be a great advantage to us if we had suitable cars, such as they have in Nova Scotia as well as in the United States, where they are kept separate. They ought to be kept so on all lines, and there should be a law passed compelling the Companies to make provision of that kind, and then if an animal lay down it would be all right. Shippers are anxious to get in all the cattle they possibly can. We can now get eighteen into a car, and perhaps with stalls we could get sixteen. As it is now, the beef, when it is slaughtered, is a mere jelly, and the result is loss to the dealer as well as to the farmer. In the United States they are making improvements in their cattle cars, which would be a great advantage to us if the Grand Trunk would adopt them. We have lost cattle by injuries received in shipping. Sometimes twenty cattle are crowded into a car, and there is then great liability to injury.

PRICES IN GREAT BRITAIN—FREIGHTS.

We get higher prices in Great Britain than we formerly obtained in the United States. Cattle weighing from 1,400 to 1,600 lbs. are the best for the butcher to handle, though I would not despise a well-fed animal weighing 1,300 lbs, but of course you have to pay the same freight as for a larger one. The charge is by the beast and not by the ton. If the rate was by the ton, and we could ship them just as we do bacon or cheese, we could sell well-bred cattle of 1,100 lbs. just the same in proportion as the others. The great difficulty is getting the space on the ships. The railway companies charge so much per car, so that on the cars it is just as economical to send a 1,300 lb. beast as one of 1,600 lbs. But on the vessel, the charge being by the head, it is different. The cost to the

[Mr. Britton.]

ship would be about the same for one of 1,800 lbs. as for one of 1,600 lbs. The price paid here for cattle has been from 5c. to 6c.—that is for export cattle, well bred, well fed, and in good condition.

COMMON CATTLE UNPROFITABLE.

There is a great difference in the quality of cattle, and we do not give anything like the highest price for common cattle. You may attend twenty fairs in the back country, say on the line of the Northern Railway, and among the 800 of all sizes, ages, and shapes which you may see, you could not select twenty-five that would pay their expenses to Europe. They are generally large enough, but are mere masses of coarse, inferior, tough, and insipid meat. They cost just as much to raise as a thorough-bred animal—in fact they consume far more food. We buy common cattle at from two to three cents per pound in the fall, to make “chased” or peddling beef. This beef is sold for \$9 per barrel, and the labour costs \$2, leaving \$7 for the beef. It is mostly used by the fishermen of the Lower Provinces. I have not fattened many cattle of late years, but I know something of the trade by being acquainted with many farmers in different districts.

FEEDING 103 “SCRUBS” AGAINST DURHAM GRADES.

In 1873 I bought 105 common native cattle back of Peterboro'; they were three years old, and I thought I would try an experiment with them. I tied them in two rows and gave them all the hay they wanted three times a day. I also gave them corn and bran mixed. I put them up in November and fed them seven months. Next to them I put two rows which I bought near Goderich—all grades. I bought the first lot for 2½c. per pound, and the others at 3½c. and 3¼c., live weight. I also fed them seven months. The common cattle required more food, for they were always eating; and during the seven months all they gained in gross weight was 130 lbs. each. The grades gained 270 lbs. each. They were about the same age and the same weight as the others. I sold the native cattle to the Americans for \$4.63 per hundred pounds, live weight; and I got \$5.37½ for the grades. I never had much experience with other grades than those bred from Durhams and common cattle, as the butchers in England and the United States seem to prefer them. The reason is that they have so much prime meat—plenty of steaks and roasts can be got from them. The butcher reckons upon losing a little on the coarse meats, but he makes it up from the finer parts of the carcass, and of course he wants all the fine meat he can get. If we get well-bred cattle there is less waste in size; there is more tallow and suet.

WELL BRED CATTLE—THE “FIFTH QUARTER.”

Well-bred cattle will shrink about twenty-five per cent. in transportation, the common cattle about thirty-three per cent., but you cannot get the farmers to understand this. There is a profit to the butcher in the amount of beef an animal will dress, and the amount of suet and tallow. The fifth quarter, as they call it, is an important consideration to the butcher—in fact, he often depends upon it for all his profit. That is the reason they want to encourage the live stock trade, for if he buys the carcass from the wholesale butcher he loses all his little perquisites. Besides, when they are shipped alive they can be put into a field, fed occasionally, and killed when it is found best to do so. My opinion is that the live stock trade will yet prove fatal to the trade in dead meat, because customers always like their meat fresh and nice in appearance. Of course, the cattle will get a little injured on shipboard, but if they are rested and fed they fully recover.

THE POLLED ANGUS BREED.

The butchers in England do not seem to take to the Polled Angus breed. The cat lies on the outsides very heavy, but when you come to cut up the joints you find
[*Mr. Britton.*]

that the fat is in a mass and not mixed. The flesh is coarse and there is more neck than the others have. Their being without horns would be a great advantage in shipping. I saw some at the Government farm and they appeared to be very nice cattle. I have not paid very much attention to them as marketable cattle. The cattle on shipboard do not suffer much from goring, but they do suffer from the weather.

IMPROVEMENTS IN SHIPPING—BRITISH DEMAND.

Improvements are being made in the methods of shipping by the Government appointing inspectors and passing Orders in Council on the subject. I think that in future the demand for live cattle in England will be unlimited. During the last five years all that the buyers complain of is the want of the right kind of cattle. According to the Government returns, England paid last year £20,000,000 to Belgium, Spain, Denmark, etc., for cattle. The supply which we are sending is a mere trifle. The cost of sending cattle from here is considerably more than from Denmark and those places, but we can raise them for less money.

QUALITY AND SUPPLY OF CANADIAN CATTLE.

Our cattle are better than the cattle from those countries, and stand next to the best English, Scotch, and Irish. The supply of grade stock for shipment is good for two or three months in the year, but during the remaining months of the year we have great trouble in getting the proper class of cattle. We are afraid to make contracts ahead. Cattle that we ship early in the year are generally bought a month or two ahead. Sometimes they are bought and shipped at once. They are mostly kept in the farmers' stables during the winter. As a rule we ship the whole year. Those of which we find a good supply are mostly bought in February, March, and April. After that we depend chiefly on pasture-fed cattle. They are of the same breed as the others, but they are not fed up sufficiently, the grass does not make them fat enough.

FEEDING GRAIN TO PASTURE FED CATTLE—SWILL FEEDING.

They lose flesh easily on shipboard. It would be a great advantage if our farmers were to give them grain as they do in other places. If farmers would look to their cattle as a market for their grain—feed their cattle with ground peas, oats, and corn—it would pay them better than selling their grain. The cattle would walk away with 300 or 400 more pounds of meat on them, and the farmer would get his money at home. I should think that grass-fed cattle would shrink eight or ten per cent. more on a voyage than grain-fed cattle. Of course the poorer they are fed the more they will shrink, and some cattle naturally shrink more than others. Swill-fed cattle do not command the same price as those which are fed on grain. Cattle of that kind are mostly shipped in the months of May and June. The objection to swill-fed cattle is that they are softer in the meat, their fat is more oily. They sell here for a very good price, and in England they bring about the same price as corn-fed cattle.

SHIPMENTS OF SHEEP.

We used to send sheep to the United States, but we cannot now, on account of the high tariff. For shipment to Europe I prefer the Southdowns or black-faced sheep: their meat is sweet and beautiful. The best lambs we get are of that variety. The wool clip is very light and they are not much bred. The sheep which seem to take best in this country are the Cotswolds and the Leicesters.

GRAIN FEEDING PROFITABLE.

To the Chairman.—I think it would pay the farmer to feed his grain to his cattle. Supposing barley was 50c. a bushel, it would pay the farmer to feed it to cattle which

[*Mr. Britton.*]

would bring 5c. per pound live weight; so it would at 60c., especially if he mixed oats or peas with the barley. A mixture of various kinds of grain is the best. I have bought cattle fed on siftings, such as chess and light wheat, and they turned out well. There are only a few men who have tried feeding their cattle grain in this country, but the Americans have done it. I could name some men in North Pickering who have tried it, and they say they can make more with the same amount of grain in summer than in winter. I advise feeding with soft grain when the cattle are on the pasture in summer. I think that would increase the quality of the supply. I would not feed them so heavy in the previous winter; but would give them roots and hay, so as to have them in readiness for summer feeding. I think it would pay the farmers best to get their cattle off at three years of age. They don't cost so much and they are matured at that age if given proper care and nourishment.

BEST CATTLE BUYING DISTRICTS.

To Mr. Dymond.—I think the County of Wellington is the best place in which to buy good cattle. I have purchased cattle pretty much in the West—that is, west of Whitby. The neighbourhood of London and St. Thomas produces good cattle; north of that there are thousands of cattle, but they are nearly all common, and the farmers are losing large amounts by not breeding better cattle. During the last two years—even in these backward counties—there has been a steady improvement in the cattle, owing to the growth of the English trade. When the farmers notice the larger prices which good cattle bring they are willing to pay for the service of a good bull. The man who purchases a thoroughbred bull pays for him the first year in the improvement of his own stock, to say nothing of the service to his neighbours.

SHEEP FOR THE BRITISH MARKET

The sheep I am sending to England are mostly Leicesters and Cotswolds. Southdown sheep are only raised to a limited extent. That is because others are in demand and they gain more meat. We send wethers and ewes—all kinds—to England, but the farmers make a mistake in not making wethers of their rams before they are too old. There is two cents difference in the price of a young ram and a wether of the same age. When they are five months old they begin to run around after the ewes and their flesh becomes coarser and tougher. The difference in taste can be noticed in the month of September. The sooner they are castrated the better: it should be done while they are young. For ordinary sheep I am now paying 3½c. to 5c.; wethers bring 4½c. to 5c. Lots are usually bought of different kinds together—say one ram in ten. The sheep are about two years old when they are shipped to Europe. When I say that wethers bring two cents per pound more than rams I mean that I would pay that much higher rate for 100 wethers than for 100 rams.

DOWN WETHERS WANTED.

If wethers were sent over together as wethers, in one flock, they would probably bring 7c. per pound—that is, for black-faced sheep. I would advise the farmers to raise Oxfords, Shropshires, and Southdowns for the English market. I don't think the Southdowns are too small if they are well fattened. They should average, at two years old, 140 lbs., live weight, which would dress about 70 lbs. mutton. Sheep dressing from 70 to 75 lbs. are the best class for the English market. I was twenty-five years in the meat business, and supplied some of the best customers, but, with the exception of a few—mostly English people, who are epicurean in their tastes, and who will pay two cents a pound more to get good mutton—the great majority of people here want quantity and cheapness: they don't care much for quality. In shipping to Europe the sheep all go together, large and small. In England the wool brings about the same price as here: the quality of the meat is the first consideration. A first-class butcher in England would not sell anything else but mutton from black-faced sheep to his customers.

[*Mr. Britton.*]

THE OXFORD CROSS GOOD.

I would prefer as a cross Oxford rams with Cotswolds or Leicesters. That cross makes first-class mutton, and the fleece would be very good—the wool is soft and fine. They weigh about 20 lbs. to the quarter, but they are full of lean meat. That weight would not be objectionable in the English market. If there is plenty of lean meat they do not object to an animal dressing 100 lbs. There is not much difference in the meat of the Leicesters and Cotswolds. Such a cross as I have mentioned would stand our climate, and they gain flesh rapidly. The cross would be a black-faced sheep. There is no doubt that a male thoroughbred conveys its characteristics better than a thoroughbred female.

To the Chairman.—Black-faced rams are in the hands of a few men, and it would be a good thing if the County Societies would buy for themselves. They should purchase some of the best bulls, rams, and stallions, and keep them for the improvement of stock. After a few years they would have stock that would command the best price in the market.

To Mr. Dymond.—If the Leicesters and Cotswolds were not crossed with the Oxford it would be a certain improvement to cross the native sheep with the Southdowns. The native sheep are a mixed breed and make very poor mutton.

JAMES BRITTON.

MR. A. J. THOMPSON'S EVIDENCE.

A. J. THOMPSON, Toronto, was called and examined.

To Mr. Dymond.—I have been connected with the cattle trade to England for the last five years. Previous to that I had been engaged all my life as a cattle buyer, butcher and dealer.

FIRST CARGO TO ENGLAND.

I went to England with my first cargo five years ago, and I have maintained the trade ever since. I have found that it has increased, and is still increasing. The demand is not unlimited as the market can be overstocked. I don't think to-day that we could ship to England the class of cattle we can purchase in Canada and make our own market.

HIGH GRADES MOST PROFITABLE.

As a rule, I would recommend for shipment to England cattle which are as near thoroughbred as possible. A cross between a thoroughbred Shorthorn and a well-selected native cow would be a very good one. I agree with Mr. Britton as to the necessity of using Shorthorns. I have shipped all breeds, but I find that an animal which combines flesh with fat is the best for the English market. You may take a middling grade steer which is rather rough, and though he may have six inches of fat on his ribs, he will not sell so well as a nice, fat, well-proportioned thoroughbred. We have a great many grade cattle of good shape, and sufficient breeding, which would command the highest price in England if they were only kept to a proper age. Farmers turn off their steers at two and a half or three years old, and though their flesh is nice and tender, they are too young to stand the voyage; you would not know them when they reached Liverpool.

FOUR YEARS OLD WANTED.

For shipment to England we should have steers not less than four years old, as you can land them in as good condition as when they are shipped. Probably a three-year old
[Mr. Thompson.]

would pay the farmer best. Five and a half cents a pound if they were kept over would be better than five cents if sold at once. A four-year old stock steer—I do not mean a fat one—would be worth say in the fall \$35 or \$40, and he will come out in the spring worth \$85 at the very least. A common steer of pretty nearly the same size and appearance, but of inferior grade, can be got for \$25; he will take just as much food, and you cannot reckon upon his being worth more than \$50 in the spring. If I found a farmer with a grade steer three years old, weighing 1,400, and another grade steer four years old weighing 1,600, I would likely pay him 5c. a pound for the two; but the four-year old would be worth \$10 more to me than the other; but if he had a lot of four-year olds they would be worth half a cent a pound more.

MIXED LOTS OBJECTIONABLE.

The great trouble with Canadian stock is this: In one lot we may have perhaps 150 steers, averaging 1,300 to 1,500, the remainder are bulls, cows, heifers and oxen; but if we had all the lot steers of about one age, a good judge could go among them, and not find any difference in their value to the extent of \$10. In the United States you can buy an unlimited number of steers, but here we cannot get enough.

PRESENT ADVANTAGE OF CANADIAN CATTLE.

There has been a little advantage in favour of Canadian shippers since the embargo was put on, because the American cattle had to be killed within fourteen days of landing. In summer in England they have no way of sending the meat through the country in refrigerator cars; so that if it was killed to-day it would have to be sold to-morrow or next day. In that case our Canadian cattle of inferior quality, going in free, and having the privilege of going inland, and selling in small or large quantities, have commanded from \$8 to \$10 a head more than American cattle—in other words about one cent per pound more. Our best cattle are altogether inferior to theirs. In cold weather their cattle will sell at from one to two cents a pound more than ours. This difficulty can never be overcome until we have a better grade of cattle, and until farmers make up their minds to keep their cattle to a proper age, and not be so anxious for an immediate return. I think it would pay the farmer to keep his cattle until they were four years old, as he would then get from 5½ to 6c. per lb., that is if he had them ready for the opening of navigation on the St. Lawrence. Last year feed was scarce in England and stock cattle were sold off—hence there has been a great demand from this side of the water.

STATE OF THE MARKET.

The market is choked at the present time. There were Canadian cattle removed from Glasgow not long ago, to England, because they could not be sold. They were good cattle and were sold in England at a loss. Another thing greatly against us is, that we have not sufficient tonnage. Even if our farmers were to go into feeding cattle, we have not enough ships to carry it at the time it should go. We have shipped some from Boston, but we are stopped by the embargo, and we cannot compete with the Americans.

SUPERIORITY OF AMERICAN CATTLE.

Last year I went up to Goderich and bought 100 head around Goderich and Seaforth, picking them out of 250 or 300 cattle. It was about the last of September. We were shipping a lot of cattle from Montreal, and another lot from Boston. My firm said that the cattle I had bought in Huron county were as good as any American cattle. I told them to try an experiment. I took eighty of the best and shipped them at Boston; they cost me 4¾ cents. I bought a lot at Boston at 6 cents per

[Mr. Thompson.]

lb. The latter lot paid me, but I lost by the others, owing to their inferior quality when they came to be slaughtered. If they had passed into the hands of the buyer, without being slaughtered, it would have been the same. My advice to farmers is, to go on increasing the amount of well-bred stock.

THE RIGHT SORT AT THE RIGHT TIME.

If we had the right kind, at the right season of the year, we could get rid of them. A four-year-old grade steer from a Shorthorn bull, weighing about 1,400 or 1,500 lbs., ought to average $5\frac{1}{2}$ to 6 cents a pound at Toronto. Farmers could get that for them at home. When you are buying a few thousands you cannot get four-year-olds weighing 1,500 lbs., though a good four-year-old should weigh much more. About 1,500 lbs. is the best paying size, and we can afford to pay more for them, because we get more. The cultivation of fat as compared with flesh is going out of fashion.

SOURCES OF SUPPLY.

The county of Wellington is where we get the best grades, though we get just as many cattle in other places. We get a great many around Goderich. They are grades, but not so good as from Wellington county; the cross has not, as a rule, been from pure blood. I have bought a great many very good cattle in Simcoe. There is a steady improvement going on in respect to the breeding of good cattle. We find this year that the farmers have fattened three good cattle to one last year. Last year we shipped fat cattle to England. It does not pay to send them to England. A steer going out in the spring is fed on the ordinary run of grass, say, to the first of September, and after he is put up he gets fat, but he does not get on the flesh; whereas, if he was fed on grain, he would turn out well.

AMERICAN GRASS FED-CATTLE.

We cannot compete with American grass-fed cattle in London or in Liverpool, and other places where there are slaughter-houses. They do not buy the live cattle at all, but go right to these places and buy American beef. If the day is warm they can buy it at a low price, but if it is cold they have to pay more for it. This trade has been a great injury to the Canadian live stock trade. I would just as soon ship Canadian fat cattle into the lairs, and have them killed, as to take them into the open market. If we were to take cattle that had been running on the prairies, and feeding on corn all their lives, and put them on pasture, it would be a great drawback to them; besides, you would have to pay so much for them that it would not pay to bring them here.

CANADIAN CATTLE SHIPPED TO BUFFALO.

High prices are paid to the Americans for them, as there is a good demand for their cattle. This spring some 5,000 or 6,000 of cattle were taken from the west of the province to the Buffalo market. As a rule they come mostly from the northern part of the country, and are a very inferior class of cattle, but they are taken down to the Genesee Flats, and, after remaining there for a time, they are turned out good cattle. Higher prices are paid for them than for Michigan and Indiana cattle, as it is said that they grow better. In that instance Canada is acting as a cattle-raising country for an adjoining cattle-feeding country.

SHIPMENTS OF SHEEP.

I don't think that sheep can be shipped to England at a profit. Last year they paid in the fore part of the year, but in the latter part of the year they were a loss. The cause of the reaction was the supply on the American side, whence they are shipping them by the thousand. Last year I shipped nearly 30,000 American

[*Mr. Thompson.*]

sheep, and I had thousands of them which were wethers averaging about 70 lbs. mutton, which are the best paying carcasses. You can get together a large lot of the kind that suits the English market. The Southdowns are the most acceptable there, though, I think, the Shropshire and Oxford breeds might well be raised here for shipment to England. The best sheep we have in Canada are the Southdowns, and a cross between them and the Cotswolds, or Leicesters,—they bring the best prices.

MORE WETHERS WANTED.

The trouble here is, that like our cattle, you cannot make up a large lot without having all sorts. Wethers are worth about one cent per pound more than we pay for sheep now. As the markets are to-day we could not pay 4 cents per lb. even for wethers. I think 6 cents would be about the highest we could pay unless they were shipped in wool in the spring, and we could get a select lot of wethers, when we might pay 7 cents. I bought 700 for shipment in the beginning of March, in Buffalo, all wethers, weighing 140 and odd pounds, for which I paid $7\frac{1}{2}$ cents, but mutton was said to be very dear in England. I believe they were a loss to the extent of \$1.50 a head, but I believe if I had taken the wool off it would have paid better, as wool was higher in Canada than in England. As a general thing, taking one sheep with another, the wool is worth about the same. If we were to cross the Southdowns with the Cotswolds or Leicesters we would have a hardy sheep, quite large enough.

SHIPPING ARRANGEMENTS.

Space on shipboard is generally taken at so many shillings a foot; and of course if you take small sheep, you can get so many more in. I can get space in that way at Boston, but in our Canadian ships we have generally to pay so much a head.

THE AMERICANS TO CONTROL THE MARKETS.

My opinion is, that before we can get rightly into the cattle trade, the Americans will have vessels enough built to supply the markets without us. They will supply the whole English market before ten years. We cannot compete with them in raising cattle either as to quality or cheapness. For two months back they have been selling their cattle delivered at Boston at from one-half to one cent less than we are paying the farmers, without taking off the shrinkage, or the expense of getting them to the seaboard. They get them ready there at a certain time of the year, the first of May, or the first of June—and there is always a market at that time. American cattle and American ships will always be plentiful. They have the territory in which to raise the cattle which we have not, and they can supply the whole British trade.

AMERICAN CATTLE DISEASE A FICTION.

There are no more American cattle diseased than Canadian. I have shipped thousands of them, and I have lost less on 5,000 American cattle than on 1,000 Canadian, because the former are so much harder. They are also finer cattle. The reason they are harder is because they have so much out-door exercise. Our cattle are put into the stall in the fall, and they are kept there all winter, so that their feet and bones get soft, and they are very easily crippled. Out of 700 or 800 cattle I have had 50 which I could not put on the ship at all. They are driven perhaps four or five miles to the station, a lot of them crowded into the car and shipped to Toronto. Then the next day they are sent to Montreal, and when they arrive there they are tired out. Farmers should always turn out their cattle to water even in the winter, as they should have a certain amount of exercise. Even with that exercise they would not be equal to American cattle, as the latter have muscles like horses, from being out of doors all the year. They are fed on corn. Corn makes good meat, though I think that peas, barley, and oats make a finer-grained meat. For out-of-door feeding corn is probably the best.

[Mr. Thompson.]

AN EXPERIMENT IN FEEDING.

I fed 100 cattle myself in the county of York this year. I bought everything for them, and paid a man \$100 a month to take care of them. I bought the cattle at about an average of $3\frac{1}{2}$ cents. Some were steers and some were bulls. I think a farmer can make good cattle at $4\frac{1}{2}$ cents. I gave them a ton of bran, a ton of pea meal, and a ton of oats. The cattle cost me \$70 apiece going out. I should think they would weigh about 1,650, or 1,700 lbs. apiece when I shipped them. They were worth $4\frac{3}{4}$ or 5 cents a pound. I sent them away on the fourth of June. They were four and five-year-old cattle, and about 50 or more of them were bulls. Real good bulls brought this year as good a price as other cattle. We bought a lot of our feed in the beginning of the season, and got it cheaper. I paid \$20 a ton for the pea meal; about \$19 for the oats, and about \$12 for the bran. We also fed a good many shorts. We used the manure on the farm and it would be worth \$2 per animal. Navigation does not open until about the 15th of May, and we have only a portion of May and about the half of June when we can ship successfully.

IRISH CATTLE.

Irish cattle this year have been very scarce. Last Monday there were 200 of them on the Liverpool market. Five years ago in July, I remember there was one Monday when there were 2,700 and odd Irish heifers on the Liverpool market, and one could not draw a picture of cattle which would be prettier. They were selling at £33 and £34 apiece, and we had cattle which looked like mountains beside them, selling for £26. That was in the beginning of the trade, and there was a great prejudice against American or Canadian beef, and that prejudice exists to some extent yet, among some butchers. To-day, I suppose, English or Irish cattle would sell for 9d. a pound, and ours for 6d. or $6\frac{1}{2}$ d. There is not necessarily any difference between the American or Canadian cattle and the British. I do not think that Canadians can compete with Americans in raising cattle of the same quality,—that is, upon an extensive scale.

DISADVANTAGES OF THE CANADIAN FARMER.

Q. Is there any reason why we should not compete with the Americans if we determined to do so? A. Yes; they have the grazing land, and they can raise cattle and deliver them at Boston and New York, and make money out of them cheaper than we can. The animals that come from Kansas City are far superior to Canadian grain-fed cattle—there is no comparison between them. People have the idea that there is no breeding among the cattle in the Western States, but it is a great mistake, for these cattle are all pretty well bred. The Texas and Cherokee native cattle have all been done away with, and every year they are taking into the country the best blood they can get. They keep their cattle until they are three or four or five years old; they are quite wild at first, but they are perhaps driven 400 or 500 miles to the railway, and by the time they arrive in Boston or New York they are tame and in good condition. Six weeks or two months ago I had a lot of cattle in Boston, and I wanted eighty or ninety to make up a shipment. I could get nothing but Colorado cattle, and I found that they sold well. I bought them for about one cent. per pound less than the native. The market sometimes gets glutted at the American outports.

SECURING SHIPPING SPACE.

The ships cannot always take the cattle from Montreal. The largest ship in the Montreal trade is the *Manitoba*, which, I think, carries 600; the *Brooklyn* carries 500; and the *Winnipeg*, 500. The rates are lower from the American ports. The ships here get about all the profit. The owners watch the state of the market, and charge accordingly. The only way in which we can do anything is to take the

[Mr. Thompson.]

space ahead, and even then it is a risky speculation. I know of men who have taken space largely, in advance, but I believe it will ruin them. To-day I would not give six shillings per head for space from Montreal, and they have contracted a-head at ten and twelve shillings. It costs about \$4.50 a head to take sheep from here to England, and about \$40 for cattle. What we need is further competition in tonnage. The animals we require should be sired by a thoroughbred Shorthorn; they should be four years old, grain fed, and ready for shipment early in the year. I don't think the embargo was laid on except for a sort of protection.

THE EMBARGO.

I don't think there was a real case of Pleuro-pneumonia at all, but a disease brought on by hardship and exposure. The cattle which were said to have had the disease were three weeks on the road, from where they were raised to the port of shipment, and were snow-blocked several times. If American cattle were allowed to go free into market to-morrow, the same as Canadian, we could not stir our cattle; but, of course, we could ship from American ports. We would then have the difficulty of competing with American cattle in quality and price. We can buy cattle to-day cheaper by \$10 a head in Boston than we can here, and freights are also lower. For the last few years the trade to England has been of great benefit to Canadian farmers, and it will be kept alive by getting a better breed of cattle.

A. J. THOMPSON.

Sittings to take oral evidence held at London, Ont., July 21, 1880. *Present*—Messrs. RICHARD GIBSON (Chairman), W. SAUNDERS and A. H. DYMOND.

MR. C. S. SIMMONS' EVIDENCE.

C. S. SIMMONS, Reeve of the Township of Lobo, was called and examined.

CATTLE GRAZING.

To the Chairman.—I am a farmer in the township of Lobo, and have 150 acres of land in that township. I have another farm in Delaware, comprising 360 or 370 acres. The land is mostly arable. That in Lobo is first class for crops or pasture, while that in Delaware is better adapted for grazing, and is used mostly for that purpose. The class of stock we graze is grade steers. We have generally made it a rule to bring up a large number of them in the fall, wintering them ourselves. We only winter-feed cattle in a coarse way to prepare them for grazing. The stock in our neighbourhood has been a good deal improved for the last twenty years by the introduction of thoroughbred males, chiefly Durhams. There was and there are now a few Galloways kept, but they are going out of view entirely. There have also been a few Devons kept in the township and county. I don't think that the Galloways improve our cattle, or that they are profitable for the agriculturist to keep in our county. The Devons are nice cattle, but they don't come up to what we want as graziers and stock raisers. During the last few years there has been an increase in the number of pure bred bulls kept by farmers, and they are paying greater attention than before to the breeding of their cows. The reason for this is that they find that they can hardly sell their common stock such as they had twenty-five years ago.

COMMON CATTLE WORTHLESS.

These common cattle don't grow to the same size with the same amount of feed, and the Durham grade will be worth \$20 to \$25 more at three years old than they will. I have been engaged in my present business for about twenty years, and have handled a large

[*Mr. Simmons.*]

number of cattle every year, so that I speak from practical experience as a grazier and shipper. For the first ten years that I was in the business I never got a lot of cattle—say 100—that would weigh 1,200 pounds each, but now there is no trouble in getting a lot that will weigh from 1,300 to 1,350. I attribute the change to the improvement in the breed of the cattle.

PAYING PRICES.

Farmers used to feed them just as well fifteen or twenty years ago as now, but they could not obtain the same results. I am not speaking now of stall-fed cattle, but of cattle kept in the yards and grazed through the summer. Cattle weighing 950 or 1,000 pounds in the spring, and going out in September, will weigh 1,350 pounds. The producer of steers of 1,100 pounds, grass-fed, would require 4 cents per pound to make them pay. Cattle of the same weight, grain-fed, should get 5 cents in order to make a profit. For steers weighing 1,300 pounds he would get $4\frac{1}{2}$ cents for grass-fed, and $5\frac{1}{2}$ grain-fed. For those weighing 1,500 pounds, $4\frac{1}{2}$, grass fed, and $5\frac{1}{2}$ grain fed. The cost of raising a 1,500 pound steer is very little more than that of raising one of 1,100 pounds; and the reason I put it in this shape is that there is so much demand for the heavier weight, and it is easy to realize $4\frac{1}{2}$ cents for grass-fed steers that weigh that much in the fall of the year.

IMPROVED DAIRYING QUALITIES.

The dairying quality of the cows has increased in the same proportion as the meat producing qualities of the steers have. For dairying purposes I would recommend grade Durhams. That class is the most profitable for the farmer every way. Of course it requires great care in breeding in order to produce the particular object you have in view. For instance, some cattle with good pedigrees are not good milkers, and you will find in all strains some objectionable animals in milking qualities, etc., but these things all depend on care in selection.

CAREFUL SELECTION NECESSARY.

I find that if you get an animal that breeds stock that are good milkers he generally produces good grazers, and good feeders. For a good feeding steer, you require to get about the same shape of head that you do for a good milking cow. The high-bred cattle are all more profitable to the producer than common cattle. In the first place, at three years old they will gain 200 pounds more than the common cattle on the same feed, and gain it more symmetrically, and have more flesh and less bone than the others, and are worth \$5 to \$10 more if of the same weight. On the average, Durham grade cattle are worth \$10 to \$20 more per head at three years old than common cattle, if raised on the same food.

THE MOST PROFITABLE FOR EXPORT.

Steers should be fit to ship to the old country generally at three years of age. Well fed heifers or steers, two years old, of 1,300 pounds, are the most profitable to the producer and shipper, but only a few are to be found of that description. Four-year-old cattle stand the journey best, but they are not so profitable to the producer. None but thoroughbred males should be used for breeding any stock, and great care should be taken that the cross is made for the purpose of strengthening weak points in the stock which it is sought to improve. The mere name of using thoroughbred animals is not all that is required, as they vary very largely. For small farmers the use of first-class males will pay the best. It is rather expensive to change at once from common cattle to thoroughbreds, and I would recommend small farmers to do it gradually.

STOCK RAISING A NECESSITY.

I consider stock-raising a decided necessity in maintaining the fertility of the soil
[Mr. Simmons.]

My experience has been this:—That, in the localities where the people are paying the greatest attention to the stock, the farmers are the most thrifty and progressive, and you see in those localities the indications of the greatest wealth, and better crops of every description. The keeping of stock keeps the land alive, both by winter-feeding and grazing.

THE MORE CROSSES THE BETTER.

We have exported some very good animals of one or two crosses, but the more crosses you can get the better they are. They feed faster, have greater breadth, and have a great deal more flesh and less bone than those of less breeding. Still, one cross is sufficient to make a decided improvement.

MEAL WITH GRASS.

I believe it would pay fifty or one hundred per cent. of the money invested to feed meal, six pounds per day, to cattle on the grass, more especially since the markets have changed and we are preparing our stock for the English trade. The cattle would be ready to go to market earlier in the season, when it costs a great deal less to ship, and the insurance would be much less on account of the more favourable weather. In raising cattle they should be got off the grass as soon as possible. I delivered forty this week. They were just wintered through pretty well with a little meal, and they are fairly good cattle now, and they will command a price of five cents. A number have been sold the last few days at five cents. Cattle that have been fed through the winter a little extra, and a portion of them given meal this summer on the grass, will run over five cents; and if those cattle had not been fed grain, it is not likely they would have commanded more than four and a half cents in the fall. If these cattle were kept through, as cattle ordinarily are, they would not weigh more than they do now, which is an average of 1,325 pounds, and they would not be worth more than four and a quarter cents.

CORN INSTEAD OF PEAS.

The best grain to feed, of our own raising, is peas, as I believe they have more fattening quality in them than anything else we can feed to our stock. Now that we cannot raise peas we have to feed corn. Barley is very good, but not so good as corn. I used to feed a good deal of peas, but since the pea crop has failed I have fed corn. I always had an idea, from the return I got, that peas would pay as well at sixty cents per bushel as corn would at forty-five cents.

BREEDING—ABORTION—FATTENING QUALITIES.

There has been very little difficulty in getting cows to breed with us. Abortion is very rare. I have made comparative tests of different breeds for fattening purposes. A number of years ago I fed stock in a distillery five or six years in succession. I had a large number of cattle of different breeds, among them some pure-bred Galloway bulls, and grade Galloway steers. I found them to be the very worst cattle I had. They did not thrive well at all. They were very cross-tempered, and the more Galloway blood they had in them the worse they were. However, they will do better in the barn or farm-yard than in the stalls of a distillery. I have grazed them, but I found that they did not put on flesh as the Durham cattle did, though they produce a very good cross when the cow is a good Durham grade, but I think the Durhams gain most and are the best cattle. I also tried the Devons in the distillery, but they are something like the Galloways—cross-tempered. I found that by crossing a Devon bull with a Durham cow an excellent steer for grass-feeding was produced. They will not grow to the same weight as the Durham grades, but they are plump and sell well. I never made a test to see what they would gain in weight in com-

[*Mr. Simmons.*]

parison with other breeds. I have fed some pure-bred Devons at my own place, and I find that they are excellent feeders.

IMPROVEMENT OF STOCK.

To Mr. Dymond.—I have been about twenty years in the cattle trade. When I began there were some Durham grades, but not very many. At that time I always bought the best I could find. A portion of what I bought were grade Durhams, though there were some Galloways. I laid myself out to improve my stock by crossing, and anything I have bred I have always bred to a thoroughbred bull. I never tried thoroughbred Galloways on my farm. I have bought steers of that grade in May or June and kept them till the fall, and I have always found that they did not improve so well as the Durham grades.

THE GALLOWAYS.

These were from Galloway bulls crossed with fair Durham grades. Those in the distillery were very disagreeable to manage, but I believe it was caused by their temper, and I have found that if you cannot get animals quite reconciled to their position, they will not feed well. I do not think their flesh was preferred to that of other breeds. At any time I have had them to market the butchers were always shy of them. If their meat is better than that of others the butchers have not found it out. Black cattle of certain varieties are rather popular with the butchers in England, but from what I can learn, the Galloways are not a class of cattle that command high prices there. I gave the Galloways just the same feed as the Durham grades, but they did not improve so fast. I am now speaking of my feeding in the distillery and grazing. I would not like to give an opinion adverse to that of Mr. McCrae as to the utility of the Galloway as an economical feeder on poor farms in early settlements. We used to have a number of pure-bred Galloways in our district, but they are all disappearing, their disappearance being the result of our experience of their unprofitableness.

DEVONS—HEREFORDS.

The Devons are a better breed of cattle, but I cannot say how they are as to milking compared with the Galloways. I do not think the Devons are profitable in our section of the country, and for draught purposes they would require to be crossed with a Durham grade cow to increase their size and improve their temper. We never had any Herefords in our locality, though I have bought them in the neighbourhood of Guelph (that is, grade Herefords), and also in the county of Lambton. They are nice cattle, but I do not think they are equal to the Shorthorns for economical purposes. I cannot tell how those were fed which I bought of farmers, but they sold well. I do not think they would attain to the same size at three years old as the Durham would, and so far as I know, there is no quality in them superior to the Shorthorns.

GRAZING AND SHIPPING.

My business consists in purchasing cattle for grazing and shipping purposes, though when I was in the distillery I was engaged in winter feeding. The animals are generally three years old when I buy them. Many graziers buy them in the fall and winter-feed them roughly, some keeping them indoors and some out. The best of my cattle this year were raised out of doors, that is, having the run of the shed at will. Last winter we fed cattle on hay and corn stalks. In the spring we pastured them. They were then three years old. I really buy my cattle at two and a half years old, and they are three in the spring. Most of our cattle are sent directly from the pastures to England. I think it is more profitable to the producer to sell pasture-fed cattle for the English market, than stall-fed cattle, but it is a difficult matter for the shipper. I am both a producer and a shipper.

[*Mr. Simmons.*]

COMPETITION WITH GRASS-FED CATTLE.

Although you get cattle just as good in August or September in point of quality, and of the same weight, yet, when you have to contend with the grass-fed cattle of England in the market, the chances are, unless it is an exceptional market, that they will bring £4 or £5 less. The reason that I go into feeding in the form of pasture is owing to the large facilities which I have got for that class of feeding. Our soil is well adapted to pasturing, and besides, our people are a little inclined to be lazy and do not care to work much in the winter. Grazing has been going on for a number of years, and has been increasing ever since I came into the township. It is now a pretty extensive business, as some farmers keep 200 or 250 steers in the summer. Last year I bought some 1,200 or 1,400, and they averaged me \$58 per head. The whole lot would average a weight of over 1,300 lbs.

HIGH GRADES FOR GRAZING.

For grazing cattle, I would recommend as near thoroughbreds as possible. I think it is quite possible to get good thoroughbred cattle into good marketable condition for England in two years with good care. I have frequently bought them weighing 1,200 to 1,400 lbs. at two and a half years old. I have always found that good two-year-olds are generally fleshy and sell well, and if they are well cared for they will stand the voyage well. Pasture-fed cattle do not stand the voyage as well as those which are stall-fed. I would prefer grass-fed cattle to those fed on steamed food, or mostly on turnips, and never let out of doors. I object very much to steam feeding for shipping purposes. Near Guelph they have been using thoroughbred bulls longer than we have done, and most of the cattle shipped from there have been fed in stables through the winter.

THOROUGHbred BULLS.

The price we give for a good thoroughbred Durham bull fit for service, is about \$100, though you can go up as high as \$200 or \$300. One costing \$100 or \$150 might be just as good for raising stock for the beef market as if it were a higher-priced and more fancy animal. There is not much difficulty in obtaining thoroughbred bulls. Farmers commence to use them at eighteen months old, and if they were taken care of as they should be they would do until they were eight or ten years old; but they are generally broken down at about three or four years of age on account of the high feeding which they get, farmers having the idea of keeping them for show as well as for service.

GRAZING PROFITABLE.

To the Chairman.—Grazing has very largely increased of late years, and I find that graziers do just as well as those that have paid attention strictly to grain-raising. I could not recommend the farmers in our township or county to change their system and go into stall-feeding. They could not turn the numbers off their farms that they do now.

To Mr. Dymond.—There are not many cattle grazed in Kent or Essex. I am strongly in favour of giving five or six pounds of meal per day to cattle which are grazing. I would rather that they did not get a pound of meal until they went on the grass, so that they might keep their large frames. They should have hay and turnips during the winter, and then, when they are put on the grass, they should have meal every day, and there will be no trouble in realizing five cents per pound for such beef in July and August—weight 1,300 to 1,350.

BRITAIN OUR MARKET—WEIGHT OF CATTLE FOR SHIPMENT.

To the Chairman.—I recommend the Durham as the most profitable beefing animal. My opinion is that our surplus stock must be sent to Great Britain, unless something [Mr. Simmons.]

happens to prevent the United States from producing I cannot, at present, tell anything about the future prospects of the trade in England, though my opinion is that the English markets will be lower than they are now. I believe Britain is our market, and will continue to be the market which we will have to cultivate. A man practised in buying stock would be able to tell by handling cattle whether they had been fed meal or not, and would give more for cattle that had been fed meal while on pasture. They could be sent right upon the ship, and get used to the journey at once. Cattle should never weigh less than 1,300 pounds that are intended for shipment. From 1,400 to 1,450 pounds is the most desirable weight in the English market. If cattle were carried by weight instead of by the head, and if they were well fattened, 1,300 pounds would be a very good weight. The butchers of England never care for cattle that weigh less than 1,300 pounds. Our own best butchers have the same preference.

TIME OF EXPORT AND PURCHASE.

My shipping is all done in the summer from the last of July to the last of October. For export I should like to have not less than three to four crosses on a good stock. Those which have four crosses are called thoroughbreds, though they should not be so called; at the same time they are eligible for registration. I would not be in favour of having such cattle registered. Cattle fed on grass only are not profitable to the man who ships them. I did ship, one season, one or two lots that did extra well, and made money for me, but generally it is not profitable for the shipper to ship them. Cattle which have been fed in the stall and allowed to run out doors to keep them in muscle, will stand shipping far better than grass-fed cattle; and steam-fed cattle, which have never had any exercise, will shrink more than grass-fed cattle. The county of Middlesex supplies more grass-fed cattle than any other county in Canada. We purchase in June, July, August and September. The difference between a well-bred steer and a common one on the English market would be about \$15 to \$20 on the same weight. Once in a while you will get a very good common steer in bulk, but they are generally rougher than the same weight of Durham cattle.

SUPPLY OF CATTLE FOR GRAZING.

To Mr. Dymond.—We have to go outside of our own county to get suitable animals for grazing purposes; a large number raised in the county are shipped at two years old and a great number are required. The supply of good grade animals is not becoming less. The cattle have improved in quality and breed, but in our locality they raise very few themselves. Graziers do not, on an average, raise more than three or four calves in a season. We have to go around Huron county, and Elgin, Lambton, and Kent. A great many come from Huron, and in that locality there has been a great improvement in the character of the cattle. I confine myself mostly to the purchasing of steers, as I find it a great advantage in shipping. Heifers will bring as much per pound, and sometimes a little more, than a steer, but there is more risk in shipping them, especially along with steers.

AMERICAN COMPETITION—THE EMBARGO.

There is an objection in England to mixed shipments. Our future prospects in England depend a good deal on American competition. We derive an advantage from the embargo on American cattle, because they cannot bring them through and ship them from our ports. American cattle have also to be killed immediately upon their arrival in Europe, and that also gives us an advantage. Independently of that, we cannot raise beef as cheaply as they can, quality for quality. I have been accustomed to frequent the markets of New York, and I find that, do our best, we cannot raise beef so cheaply as they can. We can raise cattle at a profit, but not at so great a profit as they can, and we can never cultivate a trade here that will be equal to that from the United States. Our cli

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mate is against us in the first place. They can raise corn, and their winters are shorter and milder. It is not uncommon to find four or five hundred car loads going into Chicago from Illinois, and they are all very well-bred cattle. And even in Missouri and Kansas they are now getting well-graded cattle. It would be no trouble to go among those four or five hundred car loads, and find one hundred car loads which would be almost called thoroughbreds.

NECESSITY FOR BETTER FEEDING.

There would be no difficulty in our having cattle of equally good quality if we fed them and kept them growing from the time they were calves; but when the animal once loses its natural flesh it is never as good an animal afterwards for the butcher. The great trouble with the Canadian farmer is that instead of keeping his steers through the winter in the condition they were in, in the fall, they generally come out 150 pounds lighter in the spring, and the consequence is that the animals can never be made so good as they might have been made with better care in wintering. These cattle go out on the grass, and are intended to be made into beef in the fall. Supposing that we paid first-class attention to the raising of cattle, it costs us more to raise them to the same weight, but we can work on a little less than they can. Another reason why we cannot compete with them is that cattle are so numerous there they can pick out any number of a particular type or breed, while here the supply is limited. You might go into our county and get 100 Durham grade steers, pretty large cattle of the same kind, which, if they were properly fed, might compete very well with the American cattle, but the Americans can get better cattle in larger numbers, and it is impossible for us to get such a type of cattle as they have on the American side. But we can compete with them as far that the trade may be profitable to us.

THE PRICE OF CORN.

Q. Don't you think it is in the highly stall-fed cattle that we cannot compete with the Americans, rather than in the pasture-fed cattle?—**A.** Yes, we can much more successfully; or we could by feeding them meal while on the grass. We import American corn since we have given up raising peas. The class of corn raised in Canada is not the kind that we use for feeding purposes, and besides it is a risky crop to grow in my part of the country. The price of corn has changed very often, and I think it would be a fine thing for our people if we could get the duty taken off corn. The duty is a serious drawback. Two years ago corn cost us 39 cents to 40 cents per bushel; at present it costs us about 56 cents in carloads. There has been a marked increase in the price of corn apart from the duty. Supply governs prices generally. We give our cattle all the salt they want.

EVEN THE TEXANS IMPROVING.

There are still many of the old Texan cattle to be found in Chicago, but even in Texas they are improving their cattle by crossing them. One cross of the Durham changes their appearance completely. The Texan cattle would be no good for grazing purposes in our country. If we were to take the Canadian grazing steers into the Buffalo market we would meet with the graziers of the Genesee flats. They buy thousands of cattle; and they say that the Canadian steers will gain 400 or 500 lbs., whereas American steers from the west will only gain 200 or 250 lbs. This difference is not attributable to the blood, but to the very poor way in which our cattle have been fed. On the other hand, the American cattle have been fed, more or less, from an early age on corn, so that to bring them in here on pasture would rather check their growth. All our best steers are grazed at home, though some of the poorer ones go to the United States.

FACILITIES FOR SHIPMENT—RATES.

To the Chairman.—**Q.** As a shipper, have you anything to suggest as to the transit of stock, such as increased facilities for shipping or anything of that kind?—**A.** I think the [Mr. Simmons.]

trade will regulate itself. I have thought the matter over a good deal, and I do not see in what shape we could arrange it. There is plenty of competition in shipping at Montreal to meet our wants. If we could ship our cattle out at the American ports the same as at our own, it would be all right; but as it is now, all the stall-fed cattle in Canada are bought every winter, and the owners are all anxious to have them go by the first ship in spring, and the consequence is that there is a rush at that particular time. I do not know how we can go to work to relieve that, but even now they can get plenty of ships by waiting a week or two. As we ship at different times in the year, we find the shipping facilities on the whole sufficient. You can get rates now at £4 stg., and later in the season it will go down to £3 stg. The exigencies of the trade are gradually being met. The Americans have no advantage over us in the way of shipment if the embargo is left out of sight. Taking it the year round, they can ship more cheaply than we can, just because our people all want to ship at the same time, and the result is that rates go up.

THE GRAND TRUNK.

The Grand Trunk used to be cried down, and I used to find fault with it myself, but now I say it is one of the best roads on the continent to do business with. Along a great portion of its line it has no competition, and for a road so situated its rates are most reasonable and anything but extortionate. We used to pay \$100 a car from Suspension Bridge to New York, and now we get rates from Ailsa Craig to Montreal for \$60, and at the first opening of the season, \$75.

SHEEP FOR FEEDING AND SHIPPING.

To the Chairman.—I am a feeder and shipper of sheep. I have bred but very few. During my first experience with sheep we had mostly Leicesters, which were very profitable, but I found as a dealer that we had to improve their size, as they were rather small. The Leicesters I refer to were the old Yorkshire Leicesters. Since then we have had a few Cotswolds and a number of Lincolns. The cross between the Lincolns and the Cotswolds is a very material improvement upon the sheep, and our locality now ranks high in sheep by having followed that cross. I never was as favourable to the Cotswolds as many are, as they are rather a soft sheep to ship. I believe a cross on the Lincolns has been of great advantage to our farmers. We have got a mixture of long-wool sheep. The Leicester matures early, and is a very hardy little sheep. The Cotswolds are larger and coarser, and require more age and maturity. They make a good cross with the Leicester for mutton and wool. I like the Lincoln sheep, and I think the cross with them has been of more advantage to us than the cross with the Cotswold, both for wool and mutton. As to hardiness, I think the Lincolns are rather more hardy than the Cotswolds. As the matter stands to-day, I believe that the people of our neighbourhood are going more into Lincolns than any other breed, and we have very few Cotswolds.

EARLY MATURITY—HEALTHINESS.

As to breeds which attain maturity earliest, the Leicesters come first, the Lincolns next, and the Cotswolds third. We have very few Southdowns. We have no diseases worth speaking of among our sheep. They had blindness for a short period, but it went away. I buy sheep mostly for shipping purposes, and hardly buy any under two years old.

WEIGHT FOR SHIPPING—BEST SEASONS.

We cannot get many wethers, but if we could we would prefer them as between a ewe weighing 200 lbs. and a wether weighing 200 lbs. There would be \$1 difference in price, but that price might be considerably greater if people were able to supply wethers in large numbers. The best weight for shipment is from 150 to 160 lbs. I fancy we could make

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more than half a cent a pound difference between wethers and ewes ; and if we could get all wethers they would probably be worth 1 cent per pound more. The best time to ship sheep is in May or June, just after they are sheared. Our farmers are making a great mistake in selling so many of their lambs. They should keep most of them until they are two years old. The wool, if they were properly kept, would be worth close upon \$5 for the two years., and if they were wethers they would bring perhaps about \$7, so selling the lambs at \$3 is a great loss to the farmer.

THE NEW YORK MARKETS—ENGLISH TRADE IMPROVING.

To Mr. Dymond.—I have been buying sheep for about twenty years. I used to ship to the New York market for butchering ; but at present we can do nothing in that market, though lambs and thoroughbreds are sold there. My present idea is to cultivate the English trade, and it has been fairly profitable so far. Sheep have advanced fully one dollar per head since we began shipping to England, which was about three years ago. The trade at the present time is rather dull. I don't know anything of the different breeds of Leicesters, except the old ones which we had at first in our locality. The crossing I speak of has not been done systematically ; but the flocks have been mixed up, and different breeds of rams have been used. I mostly buy my sheep from my own neighbourhood ; but when shipping I have bought all over the country, and even down below Toronto and elsewhere.

BETTER TO KEEP THE LAMBS.

It would be a great deal better if people would keep their lambs, as Canada, and especially Ontario, is well adapted to sheep raising ; better I think than any other portion of the Continent of America. The qualities which make it so favourable are the climate, the dry soil and the excellent pasturage. Sheep, with anything like good care, should be ready to ship to Europe by the middle of June.

CLIMATE—WINTER TREATMENT—PRACTICAL ADVICE.

I don't think our winters are hard upon sheep, and I don't believe in keeping sheep in close pens. Our farmers have generally places like open sheds, into which the sheep can go at will, while at the same time they are able to obtain an abundance of fresh air and exercise. We have no persons among us who keep very large flocks, and there should not be more than 35 or 40 kept on a hundred acre farm. Upon such a farm there should not be more than 15 or 20 breeding ewes, and the lambs should be kept until two years old. The scarcity of wethers does not exist on the other side as it does here ; but even if the Americans were able to produce all wethers they would not sell as well as ours, as they do not make such good mutton, as the breeds are more mixed, and the meat coarser. I would not advise the breeding of the Cotswold for profit, unless it was crossed by some other breed. When you bring a sheep up to 200 pounds there is great risk in shipping, and it does not bring so much in proportion as a smaller sized animal. After every shipment which we make containing a large number of these heavy sheep we get letters saying it was a great loss to send such animals. My object is of course to get the best mutton.

THE OXFORD DOWNS—BLACK-FACED SHEEP.

I think the Oxford Downs would do well in this country, and I would like to see them tried—they are very large sheep. The Southdowns are rather small to cross on the Leicester ; but I think they would do well to cross on our mixed breeds. I find a preference for black-faced sheep in England ; and if I could get shipments of black-faced wethers of fair size there is no doubt they would realize a good deal better price than mixed lots, consisting chiefly of ewes, such as most of our Canadian shipments are. That is the kind which I would advise our Canadian farmers to raise. We have had occasional Southdowns crossed with our Leicesters, but not enough to be of any account.

Mr. Simmons.

WOOL—PROFITS.

The demand for wool has lately changed in favour of a medium wool, instead of such wool as the Leicester and Cotswold produce. That would be a point in favour of the Down. In shipping to England we pay for ship-room by the head. A good sheep at 160 pounds in the ordinary season of shipping will bring as much as one of 200 pounds—the price per pound being higher. I am a believer in mixed husbandry. You can keep five sheep to two years old at the same cost as you can a steer. Their wool would be worth about \$5 each, and if they sold for \$6.50 or \$7 they would realize in all about \$60. The manure of the sheep would be fully equal to that of the steer—in fact it is more valuable, as it is distributed about the land. We take about the same care of sheep as we do of cattle.

C. S. SIMMONS.

MR. JAMES McARTHUR'S EVIDENCE.

JAMES McARTHUR, of Ailsa Craig, was called and examined.

To Mr. Dymond.—I have been farming since childhood. I cultivate about 400 acres by mixed farming, but mostly by stock raising, principally cattle. I graze cattle and buy them for that purpose. My business is something similar to that of Mr. Simmons.

CATTLE SUPPLY—GRAZING IN MIDDLESEX.

To the Chairman.—It is pretty difficult to buy the cattle we require without paying too much for them. Cattle in our neighbourhood have been much improved by the use of thoroughbred males; and the Durhams have improved the stock most, both for fattening purposes and as milch cows for farmers. For a general purpose cow a cross with the Durham has answered well. I have noticed a considerable increase in the number of thoroughbred males during the last few years. The reason I have difficulty in buying the class of steers I want is that there are too many graziers in that part of the country for the number who are raising stock. Taking a circle with a radius of six miles from my farm, there are forty-six individuals who keep on an average forty-eight cattle each for grazing purposes, or about 2,300 in all. All these persons buy cattle to graze. They get all they can in the neighbourhood and they go north and west for the balance. We winter about one half our cattle. We buy at two and a half or three years old. In the winter we let them go to the straw stack for the most part, and towards spring we give them hay. We feed them no turnips. We generally sell in June or July, allowing the purchaser to take them away in August, September, or October. They are not ready for market in June.

THOROUGHBRED CATTLE NEEDED.

Thoroughbreds fatten fully as well as common cattle, and get more meat on them, and I think on the whole we get a better price for them. We have to pay more for that class of cattle—as much as \$5 or \$10 a head. I would not recommend any but thoroughbred males for breeding. I think a person owning one hundred acres should begin with at least one thoroughbred heifer, more for the purpose of learning how to take care of thoroughbreds than anything else, before getting a larger number.

STOCK RAISING—MANAGEMENT.

I consider stock raising a necessity to keep up the fertility of my farm. I breed to some extent. I am not particular at what time thoroughbreds drop their calves, though formerly we used to breed them in the spring. We generally feed the calves with a pail, and wean.

[Mr. McArthur]

them at four or five months old. We sometimes give them grain the first summer, and we feed them pretty well right along. I don't stall feed to any extent, and do not grow any turnips. I had a Highland bull once, and I bred from him and common cows; they happened to be along with my fat cattle; I could not sell the three and four year olds unless I sold the two year olds with them. The bull was not a very good one, but the cattle did very well. There used to be Galloway grades in our neighbourhood, but they are going out, as the drovers would not give so much for them as for Durham grades. I don't fancy the cross they make with the common cattle, and I would not care to buy them if I could get Durham grades.

PASTURING PROFITABLE.

To Mr. Dymond.—I own about 600 acres of land, of which about 150 acres is pasture, the most of it permanent. The most of the land is suitable for cultivation, but I find pasture the most profitable, and it involves less labour than general farming. The price of the animals is about our only outlay. Last spring good cattle could not be got for less than about four cents per pound, and the average weight was about 1,050 pounds. That was about the first of May. I commonly sell in June or July, but the cattle are not sent off until July, August or September. They are supposed to gain about 300 pounds in weight in that time, and we expect to get about 5 cents for them. I have been feeding cattle for about twenty-eight years, and my profits have varied from about \$6 to \$20 per head. Many cattle will not average an increased weight of 300 pounds. In addition to the price of the cattle we have the manure, which we consider a very great benefit to the farm, as it keeps the land ready to break up at any time, and improves the quality of the grass.

IMPROVEMENT OF THE FARM.

I have been on one of my present farms ever since I began farming. There has been a gradual improvement in the quality of the farm since I took it, and that has generally been the case with the farms of those in the same business as myself. In fact that has been the case in the township generally wherever cattle have been raised. Before the English market opened we had to depend on the American and Montreal markets, but we do not send any to the United States now. I do not feed meal to stock when they are pasturing, and I don't think it would pay to do so, as the additional weight or improved quality would not be sufficient to repay us for the outlay. I have not tried that system, however.

HIGH GRADES PREFERRED—SALT.

I do not ship directly myself. I am gradually grazing an improved class of cattle. I don't care how near thoroughbred they are, but I prefer a high grade to a low one. I think when they are nearly thoroughbred they thrive as well on the grass as a low grade, though perhaps they would not do quite so well for wintering. At the end of winter the common stock lose less than thoroughbreds, but they have generally less to lose. Thoroughbreds pay better for good feeding at all times than common stock. I have not gone extensively into draining on my farm, and I have done nothing in the way of artificial manures. I give cattle all the salt they can eat twice a week. I use Goderich salt. I find that our cattle in summer, and especially our milch cows, often chew the bones which they find lying around the fields, possibly because they want some element which is not present in the soil. I have not tried bone manure.

SHEEP FARMING.

To the Chairman.—I have always kept sheep, and I think keeping twenty or thirty pays me first rate. I keep Leicesters with a cross of Cotswolds. I have no trouble in disposing of the wool at the full market price. I commonly have a few for breeding purposes, the rest I sell to the butchers. I sell them when they get too old to breed from.

[*Mr. McArthur.*]

I commonly sell lambs, but I think it would be advisable to keep a few wethers every year. We generally get from $6\frac{1}{4}$ to $6\frac{1}{2}$ pounds of washed wool from each sheep.

To Mr. Dymond.—The local buyers, I don't think, make much difference between wethers, and ewes or rams.

HORSE BREEDING—CARRIAGE HORSES AND ROADSTERS.

To the Chairman.—I raise horses for sale. The class most in demand both for the local and the export trade are agricultural horses, but I have always tried to breed carriage or roadster horses. I breed from a good sized mare and a thoroughbred horse, or a carriage horse. My practice has been very successful. Sometimes I pair them as carriage horses and sometimes I don't. The agricultural horses of which I speak are good strong farm horses, partly Clyde, but without being too rough, and weighing 1,200 or 1,300 pounds. At five years old they would be worth about \$150. My carriage horses on an average would not be worth much more than that. There is more risk in raising the carriage horses than the others. I think a blood horse is the best to cross our common mares with in order to produce a general purpose horse. Horse raising on the farm I have generally found profitable. There would not be much difference in the cost of raising a colt and a steer, respectively, up to three years old, in my neighbourhood, as the colts are not properly cared for. If farmers were to give them a little more care I think they would pay for it in the end. There is greater risk in raising horses than cattle. The stallions mostly used in our neighbourhood are general purpose horses—that is, a cross of the Clyde and the common, or the blood mares. Whenever a colt happens to be pretty good they keep it as a stallion and breed from it. I think it would be useful to tax stallions, though it would be pretty hard on some people. The highest priced colt I ever raised only cost me \$1 for the service; the stallion was a French one. I don't think there are any prevailing horse diseases in our locality.

To Mr. Dymond.—The French horse I alluded to was travelling at a low figure in order to get into custom. He was a small horse, not much larger than a pony, and he was put to a good sized, loosely built mare. The colt was a good sized farm horse. I was not of course breeding in that case from a pedigree at all. The general purpose horse is one of no traceable pedigree as a rule. Any good mare put to a fairly good stallion might produce them. There are only two classes of thoroughbred stock which I would recommend in our part of the country, and they are French or Blood, because our mares are not large enough for the Clydesdales. We don't use large horses, but in the township adjoining ours they go more into raising heavy draft horses than we do. We require our horses more as roadsters and to do light work. I don't advise farmers to go into horse breeding as they do into cattle breeding, but I think one or two horses raised every year can be made profitable, as the expense is trifling and the trouble small. The farmer can get two or three years' use of them on the farm and then dispose of them. There is a good demand for any good horses, no matter what particular kind. The demand is mostly foreign. For general purpose horses for export, we get something like \$125. A horse of that kind would hardly be in perfect condition. It is a habit of the farmers to sell in rather an under condition. In the spring we work our horses a good deal, and it is just after seeding that the demand is highest. Many of them are in condition fit for work, but they are not in first-class condition, as the price very often comes down before they get into condition.

LARGE SHIPMENTS OF CATTLE.

To the Chairman.—Within a radius of six miles 4,101 head of cattle were shipped from Ailsa Craig station last year; forty car loads of sheep, numbering 5,994 head; and one car load of hogs, numbering 59. They were shipped to various markets. I imagine that the large trade is due to the adaptability of our country to that business. There is plenty of water; and cattle will feed as much in one month in our section as they will in six weeks around Guelph. The district I speak of consists of portions of Lobo, London, McGillivray, and East Williams.

JAMES McARTHUR.

[*Mr. McArthur.*]

MR. JOHN GEARY'S EVIDENCE.

JOHN GEARY was called and examined.

STALL WINTER FEEDING.

To Mr. Dymond.—I am a large farmer in this neighbourhood, and am engaged in feeding steers. My business is chiefly confined to stall and winter feeding. I feed from eighty to one hundred each year. I have bought them of all ages, but I prefer them over three years old for feeding purposes.

A SHORT SUPPLY OF THREE YEAR OLD GRADES.

I have very great difficulty in getting the class of steers I want, from the fact that our farmers do not seem to realize the necessity, as yet, of breeding good animals, though now they are beginning to realize it a little more than before. The Shorthorns have done most to improve the common stock of the country, but the cattle in my neighbourhood have not been much improved by the use of thoroughbred male animals. Farmers do not use them sufficiently, many of them preferring to take the cheapest animal they can get.

NO PROFIT IN FEEDING "SCRUBS."

There is no profit at all in feeding a common steer to three years old, but there is a small profit on a good grade. By feeding good grades I can do so without loss.

CLASS OF ANIMALS WANTED—PRICES.

The steers I buy for feeding average about 1,100 to 1,200 pounds; most of them are three years old, coming four. I have fed a few under that age, but not many. I paid last fall from 3 to 3½ cents for steers, according to quality. In the spring they average, after being fed, about 1,476 pounds, and are worth about 5½ cents.

PROFIT ON THE MANURE.

I feed principally for the manure, and if I make the value of the manure as a profit, after paying labour and other expenses, I am perfectly satisfied. I am feeding stock as much to improve my farm as for any profit I make out of the steers.

COST OF FEEDING.

The cost of feeding a steer for six months, say from November 15th to May 15th, is, or rather has been to me, 23c. per day.

CORN—LINSEED.

The food I principally use is corn, but during the last two months I usually feed a little linseed meal. The meal in our market is worth from \$27 to \$32 a ton. I mix it with other food. Weight for weight it is worth nearly twice as much as corn.

THREE YEAR OLDS BEST.

If I were raising steers I would try to ship them off at three years old, but they must be properly raised to do so. They should be as heavy, and worth as much, at that age, if properly raised, as the common run of animals are at four.

[*Mr. Geary.*]

NONE BUT THOROUGHbred MALES.

None but thoroughbred sires should be used for breeding purposes. If I could get the services of common bred sires free, and had to pay \$4 a cow for the thoroughbred sires, I would prefer the thoroughbreds. I consider stock raising a decided necessity in maintaining the fertility of the soil.

TIME OF FINISHING GRASS FEED.

I buy my steers from the present season on until shutting up time, which is about the middle of November. I don't feed them any grain while they are on the grass.

YORKSHIRE CATTLE FEED.

I have never tried any of the advertised cattle foods except once, and then for a special purpose. I had two steers last winter in my barn; they were among the finest I had, but for some reason they would not eat anything but hay, and a farmer recommended me to try the Yorkshire cattle food. I did so, and I found it had a very good effect by bringing them to their appetite. I regard it more as a tonic than a food. They did not gain any faster or eat any less food than any of the other animals, though I believe that is claimed for those foods.

ROOT CULTIVATION.

I did not feed any roots last winter, as all my root crop the previous summer was destroyed by a hailstorm. I consider roots properly cultivated a profitable crop to grow, and consider them very useful in stall feeding.

GALLOWAYS AND SHORTHORNS.

I have made no comparative tests of the different breeds for fattening purposes. I have had experience with the Black Galloways on the common or native cattle, but I prefer the Shorthorn. The Galloways don't domesticate as quickly as the others, and are naturally wilder, and the result is that they do not feed so rapidly. One cross of a Shorthorn bull will make a very good steer.

LOSS ON COMMON CATTLE.

I lived until sixteen years of age on a farm, and have been engaged in farming for the last seven or eight years. I was not engaged in shipping cattle before the last two years. The animals which I buy, weighing about 1,200 pounds, are not all grade animals; some are common. I think I had about 30 or 40 head which were not Shorthorn grades; the remainder were all pretty well bred. The 40 head which I have mentioned were a very low average in weight, and I lost money on them. Some of the cattle went as high as 1,600 and 1,700 pounds. Most of them were in fair condition when I bought them.

WELL BRED CATTLE.

The well bred cattle more than doubled their value in the six months. I fed them almost entirely on corn, which cost me the whole season through \$21.26 a ton.

CORN PREFERRED TO PEAS.

There were, comparatively speaking, no peas in this country last season, but I prefer corn even when peas are to be had. I can get better results from corn than from either peas, barley or oats. At the present price of corn I don't think there is any profit in

[Mr. Geary.]

fattening cattle except the manure. If I had my choice I would prefer giving a higher price and getting cattle of a higher grade. My experience has been such from the experiments I mention, that I would not buy common cattle to feed at all.

THREE YEAR OLDS NOT OBJECTED TO.

I don't think a four-year-old animal takes better on the English market than a three-year-old, and I have not found that the former stand the voyage any better if the three-year-olds have been properly fed.

GALLOWAYS AS FEEDERS—MANURES.

I did not find that the Galloways were better feeders than the Shorthorns. They require more coaxing to take their food. I use no manures except natural manure, but I plough a great deal of clover. I take one cutting off and plough the second crop in. My farm is not managed altogether on stock principles, as I grow a great deal of grain. I have 250 acres, two-thirds of it under cultivation.

CATTLE TO SUIT THE BRITISH MARKET.

To the Chairman.—To suit the market in Britain, I would recommend the farmers to produce Shorthorns. I think for a number of years yet we will have a market in England, but whether it will be remunerative will depend largely on the amount of stock sent from the United States and other places. I have difficulty in finding stock suitable for the foreign market. The best weight for shipping is from about 1,400 to 1,500 pounds, heavier animals than those sell well in winter time, but in the principal season we have for shipping here they don't sell so well as those of about 1,400.

BEST SEASON FOR SHIPPING.

The best season for shipping is early spring. I have shipped grass-fed cattle, but I find they shrink more than those fed on grain. We don't combine grain feeding with grass feeding; if we did I don't think they would shrink so much. If I were grazing I would feed some grain with the grass.

SHIPPING SHEEP.

The best weight for sheep for shipment is from 140 to 150 pounds. I should not like to ship them under 140, or cattle under 1,400. Occasionally I have found it profitable to ship grass-fed steers, but at other times it is not. It depends on whether or not you have a good market.

SHRINKAGE OF GRASS-FED STEERS.

I cannot estimate the comparative shrinkage of grain and grass-fed steers; I only know from inquiries of persons in charge of the cattle going across, and they all say that grass-fed cattle shrink much more than grain fed cattle.

HIGHER PRICES IN ENGLAND FOR GOOD GRADES.

I could form some estimate of the comparative value of a thoroughbred steer and a common steer of the same weight in the English market. The well bred animal of good quality will always sell for one penny a pound and sometimes twopence a pound, more than the other. Of course if you get a rough animal, even if it is well bred, the difference will not be so great. I think the discrimination is the result of real merit, as there is more beef on well bred animals, and they cut better. They carry their beef on the parts where it is worth most per pound.

[*Mr. Geary.*]

THE POLLED ANGUS.

To Mr. Dymond.—When I recommend Shorthorns for this country, I do so in view of the English market as well as the home market. I have sometimes noticed that the Scotch Polled Angus will sell higher than others. I have not considered the propriety of keeping the Polled Angus breed, but I don't like them myself.

AMERICAN CATTLE RAISING.

I think the Americans can raise cattle more cheaply than we can. In some parts of the United States they can bring them to prime condition at a less cost than we can.

FIRST-CLASS CATTLE ONLY FROM CANADA.

Our strength consists in exporting only first-class cattle; and any person who follows out the business will only lose by sending any other kind. Each animal sent is sold on its own merits on the other side of the Atlantic. I have shipped direct on this side. Some purchase in the lump and some do not. The cattle I sent there last year were nearly all steers. This year I sold my cattle here.

INJURY FROM INFERIOR CARGOES.

From what I heard I think the Canadian cattle trade suffered last year on account of the irregular and uneven character of the cattle sent across, but this year early shipments have been better, and have come nearer to the prices of American cattle, in many instances selling for the same prices. American cattle brought higher prices than ours last year, but any good cattle sent amongst the Canadian cattle will sell as well as theirs.

DOWNS AND DOWN CROSSES OF SHEEP PREFERRED.

I have been shipping sheep of mixed classes, but good fair sheep are more easily procured than cattle. In Great Britain they prefer the Downs for mutton, and I think the supply of Down sheep is increasing. Crossing the Down on the Leicester or Lincoln produces a better sheep for mutton purposes than breeding all Leicesters or Lincolns. It is not at the present time possible for us to send over shipments composed entirely of wethers, as farmers have not been in the habit of raising wethers. They have been breeding sheep for wool purposes. I have shipped from Montreal and Halifax but not from the American ports.

THE EMBARGO—FREIGHTS—WANT OF SHIPPING FACILITIES.

I think the embargo on American cattle has been a slight advantage to us, but our Canadian shipowners take advantage of it and take it away by charging, when markets are good in England, excessive rates of freight. I was not able to get space at all this year. Myself and two neighbours fed a number of cattle last winter, and we fully intended to ship them. We didn't sell them until the end of May, but kept them for the purpose of shipping. We found it was impossible to get space until along in July; the difficulty relaxed as the season progressed. In the spring this year there was a dearth of accommodation, and we were compelled to sell instead of shipping, though it would have been better for us to ship than to sell.

AMERICAN PASTURAGE.

To Mr. Saunders.—The reason that Americans can raise cattle more cheaply than we is, that they have larger ranges of pasture, and they can also grow corn more successfully and cheaper than we can. The greater distance from the seaboard is a very small item in passage; I don't think we pay one-third less passage to the seaboard than they do.

[*Mr. Geary.*]

RAILWAY COMPETITION IN THE STATES.

To Mr. Dymond.—The competition among American railways is very great, and they have to reduce the rates. I know of no efforts being made to provide greater accommodation in the way of vessels; shipowners seem to understand each other pretty well.

DECLINE IN NUMBER OF VESSELS.

A year ago this spring we were able to get a great many outside vessels that didn't belong to any of the regular Montreal lines, but this year they didn't come into port at all until late in the season. I don't know whether shipowners could keep these vessels out. What I mean by their being outsiders is that they don't belong to any particular line of steamers, but are occasional vessels not owned by the same parties. The attraction which brought these vessels a year ago last spring was the cattle trade, they ought to have had the same attraction this spring, but it didn't seem to bring them. These vessels brought out cargoes last spring of a heavy class of freight. As a matter of interest, if I were going to continue to ship, I would prefer having the American ports to ship from, notwithstanding the competition, that is, supposing the embargo were removed. At the present moment, when cattle are scarce, shipowners are almost begging for freights, rates have fallen off considerably, and there is now plenty of accommodation offering at £3 per head.

IMPROVEMENT IN CANADIAN CATTLE.

To the Chairman.—American cattle have not sold for higher prices in England this year than ours, but they did before, because they were better bred and of better quality. There have been more good cattle shipped from Canada this year than ever before, and there has been a general improvement in the feeding and rearing of cattle. I never had any reason to find fault with the facilities afforded us by the railways for shipping, that is between here and Montreal. I cannot speak of the facilities to Halifax this year, but when we did ship from there the facilities were very bad, but I understand that they have been improved. The journey down there is very bad, and this fact has proved detrimental to the shipping trade from Halifax.

CORN A NECESSITY.

To Mr. Dymond.—The use of imported corn is a necessity, in the absence of a sufficient supply in this country. The corn raised in the counties of Kent and Essex is very much the same corn as we use, though there is more of the old yellow corn in it than that which we get in the United States. In these counties they grow principally white corn, but they also grow some yellow. As a matter of fact the corn grown in this country is entirely insufficient for the consumption. I don't think it is profitable to fatten on corn at anything more than one cent per pound to make the cattle fed on it profitable.

PURE LINCOLN IMPORTATIONS.

Of sheep I prefer breeding pure Lincolns, as I think they are better adapted to this country than either the Cotswolds or the Leicesters. They retain their wool much better than the Leicesters, and the demand for it is just as good. I have imported a large number of Lincolns from England with a view to their wool, to their quality as mutton sheep, and their general adaptability to this country. I think crossing the Leicesters with the Lincolns produces a good sheep, and one that gives good wool. I breed only pure Lincolns; they are a very hardy and easily kept sheep.

WINTER TREATMENT.

In the winter, when the weather is not stormy, I let my breeding ewes run out, though I keep a shed open to them, so that they can go in when they please. I haven't bred any for exportation yet. I think our ordinary sheep are all better than our cattle. I consider that raising sheep pays.

JOHN GEARY.

[Mr. Geary.]

MAJOR JOHN PETERS' EVIDENCE.

To the Chairman.—I have a farm in this neighborhood, and I am breeding cattle as well as horses.

DURHAMS SUPPLANTING DEVONS.

In the past I have bred mostly Devons, but we are not breeding them so much now. I prefer Durham cattle, as there is more demand for them in the market. They are the best breed for improving the common stock of the country, both for dairy purposes and for beef.

GOOD DEVON STEERS.

We have raised some splendid steers from Canadian cows crossed with Devon bulls, but they are not so heavy as the Durhams, and I prefer the Shorthorns for breeding good grades.

THOROUGHBREDS COMPARED WITH COMMON CATTLE.

A thoroughbred steer has a better frame, is better made, and fattens much more quickly than the common steer. He will put on more beef, and it will sell at a higher price per pound. I stall feed four or five cattle in the winter, but I don't do any grazing. No bulls should be used but thoroughbreds. Stock raising is a decided necessity for maintaining the fertility of the soil.

MANAGEMENT OF CALVES.

Our calves generally come in April or May. We let them suck the cow until the fall, when we take them away and house them. In the summer when they are running out we give them nothing but milk, but during the winter we feed them liberally. We breed the steers which we stall feed. They are not allowed to suck—what I have just said as to letting the calves suck the cows applies only to thoroughbreds.

FEEDING STEERS FOR MARKET.

We begin to feed the steers when they are about three years old; we let them get their growth up before we begin to feed. We put them in when $2\frac{1}{2}$ years old, and we generally sell them about June. Some of them go from 1500 lbs. to 1800 lbs. live weight. Shorthorns weigh full 300 or 400 lbs. heavier than Devons, but we sometimes get better prices for nice Devon heifers, if they come in about Christmas.

DEVON AND DURHAM BEEF.

I think there is a difference between the Devon beef and the Durham beef, much the same as there is between Southdown mutton and Lincoln or Cotswold mutton—I mean that the Devon is shorter grained and nicer. I don't know that I could tell the difference at the table—the difference is not so great that I could tell it from the meat alone.

OATS AND BARLEY AS FEED—PEAS—CORN.

For feeding purposes I generally use oats and barley. I feed my cattle on these grains from choice, as I don't think they do so well on peas. They like corn, however, and I think it makes a more solid meat than barley; but the cattle will not eat it with such relish as they will barley and oats chopped together. We generally feed them a quart of corn meal and give them some bran along with it. Barley would have to be a less price than corn to make it more profitable to use.

[*Mr. Peters.*]

BREEDING COWS—ABORTION.

I don't think it is desirable to keep breeding cows in high condition. We have no trouble in our neighbourhood with abortion, milk fever, or any other disease.

To Mr. Dymond—The only quality for which I prefer the Devon cattle to the Durham is the superiority of their meat.

DEVONS FOR WORKING OXEN.

The Devon is the best for working purposes. If a thoroughbred bull of that breed is put to our Canadian cows, good working steers are produced. They would be quite large enough. I have bred them in that way and they have turned out splendid oxen.

DIFFERENCE IN MEAT NOT APPRECIABLE.

The difference between the meat of Devons and Durhams would not appreciably affect the market demand for them. The Canadian butcher might give a trifle more for the Devon, but not enough to compensate for the light weight of the Devon in comparison with the Durham.

THE DURHAM MOST POPULAR.

I am told that in England the Devon brings more than the Durham, but shipping in the way we would have to do to Europe, it would pay us better to ship the Durham than the Devon; in the matter of economy we would realize most from the Durham. I don't think I have sent any thoroughbred steers to market at less than three years old. I have some grades but not many. I think Durham cattle are generally the best tempered, and on a farm they will keep much easier than other breeds, if fed well; but upon rough food the Devons would have the advantage.

LEICESTERS—SOUTHDOWN—LINCOLNS.

To the Chairman—Of sheep we keep a few Leicesters and Leicesters crossed with Lincolns. We used to keep a few Southdowns, but we got rid of them, as there was not so much demand on the other side for their wool. I like the Southdowns very much. I tried crossing the Leicesters with them, and I got a fine mutton sheep. I think they gained fully five or six pounds to the quarter by crossing them. They would go 80 or 90 lbs. dead weight. The Lincoln is a fine sheep for improving the breed in point of size. Crossed with the Leicester, it makes a very nice sheep, but I would not recommend it for mutton.

JOHN PETERS.

Sitting to take oral evidence, held at Chatham, July 23rd, 1880. *Present*—Messrs. MALCOLM (Chairman), and DYMOND.

MR. JOHN SMITH'S EVIDENCE.

JOHN SMITH, of Harwich Township, was called and examined.

STOCK RAISING, FATTENING AND PASTURING.

To Mr. Dymond.—I have been engaged in stock-raising and stock-dealing about six years. I have also been engaged in fattening and pasturing. We buy our cattle in the spring and late winter, sometimes selling them off the grass in the fall, and sometimes feeding them in the stalls and selling them in the spring. I am also connected with the business of butcher, and I buy for the market. We make our purchases in the spring or late in the winter, and buy cattle from two to four or five years old.

[*Mr. Smith.*]

TWO-YEAR-OLDS PREFERRED.

We prefer them for our purpose from two years old if they are good quality, though it is hard work to get them a good size at that age. We purchase very nearly all the cattle that are offered, because being engaged in the butchering business we can use them. When we purchase with a view to shipment, we select the best of our cattle for the old country market.

GRADES PREFERRED FOR SHIPMENT—TWO CROSSINGS BEST.

For shipment we prefer from one-half to three-quarter bred Shorthorns. Two crossings of the Shorthorns are the best. We find that thoroughbreds do not do quite as well with all the others as grades do. We have tried a few of them, but they do not do so well on the food we give them. In other words, thoroughbreds would require a class of food not quite consistent with our arrangements or business.

GOOD GRADE AT TWO YEARS EQUAL TO A "SCRUB" AT THREE.

A well-bred animal at two years old is equal to a common animal at three. We give about the same price for both, though we would rather pay more for a good grade at two years old than for a common animal at three.

WINTER FEED.

As a rule, we buy our cattle in February, and feed them hay and good straw until the grass is ready. We do not feed them in the stall in the spring, but out of doors. We find we have to start as early as that in order to get the cattle we want, and that it pays us as well to feed them.

THE PRICES PAID.

For such steers as we buy the price we pay is about \$25, though this year it has generally been about \$30 for first quality. The average weight of these cattle would be from 900 lbs. to 1,100 lbs. We have to pay about three cents per pound for good cattle of that description, and we pay less for inferior ones. We get many of these animals for \$15 to \$20, weighing about 800 or 900 lbs. We find among the farmers a tolerably abundant supply of fairly good grade cattle. We buy for about twenty miles round Chatham.

CLOVER—CORN STRAW—PASTURE.

We use clover hay and straw to feed them upon. We use some corn straw occasionally, and it is very good food; we rather prefer it to hay, but we require a larger quantity of it; I don't know that it is any more fattening than hay. We have considerable pasture land between what we have ourselves and what we rent—about 500 acres altogether. Good pasture, with very little bush on it, is worth about \$3 per acre.

SEASONS FOR SHIPMENT.

When we stall feed the cattle we do not ship until spring; pastured cattle for England go about September 1st. If they are not ready, then we feed them corn on the pasture and have them ready to go off. We sell them the same fall—all that are fit to go at that time. We do not ship ourselves, but we sell to those who do. We sell about 100 head every year. We sell grades and thoroughbreds, and sometimes those which are neither; but they must be older than the others. I have occasionally seen some of these common cattle that did very well. We generally get the price by the gross weight.

[*Mr. Smith.*]

PRICES OBTAINED FROM SHIPPERS.

Our cattle sold for 5 cents a pound this spring after feeding in the stall, but not on the pasture—those that were bought the year before. If the market is good in the fall we sell them that season ; but, if not, we put them in the stall and feed them. We find that pasture fed cattle bring good prices ; those sold off the grass generally bring about $4\frac{1}{2}$ cents per pound. Of course there is something comes off the price for freight, as the further west we go the freight will be the greater. We sometimes buy good young cows, but they must be well bred. A good, well bred heifer, will put on more weight than a steer, and sell for the same on the English market.

COST OF FEEDING.

To the Chairman.—We claim that it costs us \$1 per month per head to feed cattle—say from February until they are put into the stable in the fall—say about the month of November. Under ordinary circumstance we can pasture up to the end of October. After we put them into the stable they cost us about \$4.50 per month. We keep them on that food for about three months. The cost of the animal, up to selling time, would be about \$48.50, and the average weight about 1,350 lbs.

PROFITS ON THE BUSINESS.

That gives us a profit of about \$6 per head ; but when they are sold out of the stable they bring more than that. If we sold them in the spring they would bring half a cent per pound more, or an average from \$60 to \$70 a head in February. It would not cost us so much to feed them another three months. It does not matter to us whether we sell them in February or in May ; we rather prefer to clear them out in February so as to be ready for the next year's work.

LARGE PASTURE LANDS.

In this county we have so much wild land that we can buy almost as many as we like, and our system, therefore, is quite different from those of Guelph or Middlesex. The average age at which we sell them is about four or five years. In February we sell them here and they go to Halifax for shipping. Steers here are generally raised on rough food up to three years old. We buy the most of our cattle from Tilbury East, though we get many from other parts of the country.

THE GALLOWAYS.

We are also engaged in farming, and we raise our own food. I have never bought any half-bred Galloways, and I don't think much of that breed as a means of improving the native stock. They do very well to cross with the thoroughbred Shorthorns, but, on the whole, they are not a favourite breed here. There has been a great improvement in the breed of cattle by the use of Shorthorn bulls.

TRADE IN SHEEP.

We buy sheep for shipment, but we do not ship them ourselves. We do not pasture them, but just buy them and sell them. We buy them from two to four years of age, but three years old is the best age. We buy both wethers and ewes. We prefer the Leicester and the Cotswold, but we have not bought any Southdowns, though the people are introducing them.

SOUTHDOWNS FOR MUTTON—SIZE OF SHEEP REQUIRED.

We prefer the Southdowns for mutton ; the weight that is preferred in the English
[*Mr. Smith*]

market is 150 lbs. live weight, or sheep that cut up to 70 or 80 lbs. The sheep trade pays us very well.

GOOD PRICES FOR A GOOD LOT.

We shipped a lot the other day which brought \$7 per head, but they were a very good lot. The price was $4\frac{1}{2}$ cents per pound; they were mostly ewes. Farmers are not going into sheep raising very much, and there are not more than one-third of the sheep in the county that there were ten years ago, owing to the low price of wool.

INCREASED ATTENTION TO SHEEP BREEDING.

Farmers are paying attention to the recent change in the demand for wool, and are crossing their sheep with the Southdowns. We have had a few crosses between the Southdowns and the Leicesters, and they do very well. The Cotswold makes rather coarse mutton. Breeders are crossing with the Lincolns to some extent.

CORN GROWING.

We raise a good deal of corn on our farm—from 50 to 75 acres. We grow the small gourd seed, or Ohio Dent. We use the corn for feeding cattle. We follow the system of cultivation that is pursued generally in the county.

METHOD OF PLANTING.

For the last few years we have drilled in the corn with a common drill, the drills being about three or four feet apart. We sow it thick in the drills so that the stalks are about one foot apart. We plant about six quarts to the acre, cultivating first with a one-horse cultivator and afterwards with a two-horse cultivator. We do not use the hoe unless there a great many weeds.

HARVESTING—HUSKING—PLOUGHING.

In the fall the corn is cut into stooks, the tops being tied together, and then it is husked and the fodder put in bundles and afterwards into larger shocks. The corn is then hauled into cribs. The stalks stand in the field about two weeks, and sometimes a month. We begin to feed them as soon as we begin winter feeding. We generally move the corn and plough the ground before the land begins to freeze up. We make the cribs four feet wide, and build them up with slabs so that the air gets through. The corn generally ripens pretty well with us, and we prefer cutting it when it begins to show ripeness, when there is a gloss on the corn. The stalks will be dead at the bottom, but the leaves will be green. We are slightly troubled with frosts.

SHELLING AND GRINDING.

As a rule, we do not utilize the cobs after we shell the corn. We shell and grind it by steam and horse power. We grind it into a coarse meal; we cut the hay by steam or horse power, and mix the meal and cut hay together and sprinkle water on it, feeding it that way four times a day.

DAILY FEED TO CATTLE—OIL-CAKE.

We give ten quarts of meal a day to each steer, and we give along with it about ten pounds of hay. We gave our cattle a little oil-cake last year, and when we did so, we did not feed them so much meal. The results from feeding oil-cake we considered satisfactory; but the cattle did well on meal and hay for a longer time. Roots are good, but we not grow them on a large scale. We paid $2\frac{1}{2}$ cents per pound for oil-cake, but it can

[*Mr. Smith.*]

be got cheaper than that. We liked oil-cake very well, from our short experience, but its use by us was rather in the nature of an experiment. I think it tends to keep the cattle healthier than they would otherwise be.

BRAN—GROUND OATS.

We sometimes feed bran or ground oats mixed with corn meal. The bran costs us about \$8 per ton, and I think it pays to feed it at that price. It seems to act like the oil-cake as a laxative, and keeps the cattle in better condition. We have never fed many oats. This year we intend to feed oats and corn ground together, with oil-cake once a day. I think we can feed in that way at \$4.50 per month. Indian corn can be grown here at thirty-five cents a bushel.

STABLING ARRANGEMENTS.

We have a double stable with a row of stalls on each side, and a feed car runs up the centre. The stable is built of lumber, but we keep it very warm. We bed well with straw.

EFFECTS OF LIBERAL MANURING.

We have found the effects of manure upon the land to be wonderful, and we manure freely. We haul the manure right out on the land in the winter time, and in some cases we pile it up and take it out in the fall. We find good effects produced in both ways, and I do not see much difference between them, only that in the one case the effects will not appear until the next crop. There is no such thing as cutting straw in our part of the country.

CHARACTER OF SOIL.

Our land is a sandy loam, with clay mixed with it, on the low land. It is good average land, and has been cleared a long time. I would rather rot the straw than burn it.

FEEDING HOGS.

We keep about thirty hogs. We pasture them in the summer time and give them Indian corn in the winter. We also turn them on the wheat fields in the fall and feed them up by Christmas for export. We find their manure very good, and we mix it up with the common barn-yard manure. I don't know that it is too rich used by itself. Indian corn will stand as much manure as you like to put on. We do not manure for oats at all, as they are apt to lie down.

ROTATION OF CROPS—BEANS.

With regard to our rotation: we grow barley after corn and then sow fall wheat, or we may sow beans and then fall wheat. We find beans a risky crop, but when they are properly treated they are very profitable. The danger with them is a wet season, which spoils the sample, and sometimes they suffer from frost. When the sample is spoiled by rain we use the beans for feeding cattle. They do not turn out very good beef, as it is rather soft.

CORN FED CATTLE AS VOYAGERS.

Corn fed cattle stand the voyage to England better than any others, according to the testimony of shippers. Pasture fed cattle also stand the voyage very well.

VALUE OF MANURE.

I have never made an estimate of the value of the manure to the land per head of [Mr. Smith.]

cattle ; but I think I would be willing to pay \$10 per head for the winter's manure. It might be worth that in the long run. This last year we manured about fifty acres, putting on about fifteen loads to the acre.

SALT FOR CATTLE AND ON WHEAT.

We use salt for the cattle, and we sowed it on the spring wheat, and the result was very good. We feed our cattle twice a week on salt, and our hay is also salted. We buy our salt by the barrel, at eighty-five or ninety cents. We use Goderich salt, as we can buy it cheaper than any other.

BERKSHIRE HOGS.

The last few years our hogs have been nearly all Berkshires, but the farmers are now beginning to cross the Suffolk with the Berkshires. Our hogs are sold here at home, but I suppose they are sent to Europe, but I don't know ; I think they are slaughtered before being sent anywhere. We have no packing establishment here ; I think from all I can hear that we are likely to have a continued demand from the old country. I have had no experience in the American cattle trade. Our corn is generally seven or eight feet high.

JOHN SMITH.

Sittings to take oral evidence held at Walkerville, County of Essex, July 26th, 1880.
Present—Messrs. F. MALCOLM (Chairman), and A. H. DYMOND.

MR. HIRAM WALKER'S EVIDENCE.

HIRAM WALKER, of Walkerville, in the County of Essex, was called and examined.

EXPORTS TO ENGLAND.

To Mr. Dymond.—I am a member of the firm of Hiram Walker & Sons, of this place. I have fattened stock for the markets for the past twenty years. Our cattle were some of the first exported to England, and we have recently sent over a large number. Previously to the opening of the British trade we exported largely to the United States. The opening of the British market enabled us to do better. We rely largely on distillery feed, but we use other food to improve the marketable quality of the cattle. We buy usually cattle two or three years old, and, so far as possible, first-class grades. It is not profitable to fatten common stock.

BUYING AND FEEDING.

We buy mostly in September and October, and the cattle are put immediately into the barns. They usually weigh when purchased 800 to 950 pounds at two years, or 1,000 pounds and over at three years old. During the winter they are fed entirely on distillery slop, except that they get a little hay to make a cud. For the last three months of feeding they get some barley ground, or corn meal, mixed with the slop. That brings them to the spring or shipping time. They are not pastured at all.

PRICES PAID AND OBTAINED.

Prices vary much in different years, and quality always governs prices. Last year the price averaged a fraction over 3 cents per pound. We give one-fourth to one-half cent more for extra grade and heavy beasts. We were offered close upon 5½ cents per pound for nearly all our cattle this year. We depend for success chiefly on the selection we

[Mr. Walker.]

make when purchasing. The average weight in the spring was about 1,300 pounds. We should commence shipping when navigation opens, and get them all off by the 1st of July.

LARGE SHIPMENTS.

We have shipped over 2,000 head this year. By reason of contracts being made in advance by other shippers there were some difficulties, early in the season, in securing shipping facilities, which made us late in the market this year.

PASTURING.

We also pasture a good many cattle. These we buy in February and onwards. They are usually good two-year old grades. We feed them first on coarse fodder, such as corn stalks, straw, etc. They are then pastured for six months, and in the fall put into the barns and fed on distillery slop, as I have already described.

STALL FEEDING—AN EXPERIMENT.

We have tried stall feeding on hay and meal, but not with profit. We bought sixty-six fine cattle in the fall; fed them on all the hay they could eat, and fourteen pounds of corn meal per day. They were bought late in the fall; put at once in the stable; tied up on the 3rd of December, and sold on the 15th of June following. They then averaged a little over 1,400 pounds per head. They were sold in England but did not realize more than distillery fed cattle.

DISTILLERY FEEDING.

There is no objection to distillery fed cattle. The meat is juicy, tender, and fine, the dry meal hardening it and giving it firmness.

MORE YOUNG GRADE CATTLE WANTED.

A sufficient supply of young cattle of the quality we need is not easily obtained. If farmers would only raise good grades they would find a beast of that class weigh, at a given age, 25 to 40 per cent. more than a common animal and be a better quality at that. Our own steers will run 1,300 to 1,400 pounds, live weight, at two years old; that would only apply to crosses. Two steers we bred, put in at two and one-half years, at three years weighed, together, 4,400 pounds. They weighed 1,600 to 1,700 pounds each when put in. Until put in they had been fed on distillery slop, with hay and grass. When put in they were fed on slop till close upon the end of feeding, if not altogether.

THE SHORTHORN PREFERRED.

We use only the Shorthorn for improving our stock. For grades we prefer Durhams, Herefords, and Ayrshires. We have turned out some fine grade Ayrshires. If a man has to buy his coarse grains I do not think he can make feeding pay. I have never raised roots for cattle. Where hay is not worth much and a farm is run down, it may pay to feed cattle on hay and coarse grains.

HIRAM WALKER.

Sittings to take oral evidence, held at Toronto, August 3rd, 1880. *Present*—Mr. W. BROWN (Chairman), Hon. S. C. WOOD, and Messrs. THOS. STOCK, EDWARD STOCK, and A. H. DYMOND.

EVIDENCE OF MR. R. W. ELLIOT.

ROBERT W. ELLIOT, of Toronto, was called and examined.

OIL CAKE MANUFACTURE.

To Mr. Dymond.—I am a wholesale druggist. I have been engaged in that business for about thirty years. During that time I have been a large dealer in oil cake, and have been connected with firms that have manufactured oil cake in this country, and I am very familiar with the supply and demand of that article both here and in Great Britain. I have given attention to the beneficial results of the use of oil cake as an article of feed. I have read reports of Agricultural Commissions and of scientific inquiries on the subject in England. I think I am competent to speak as an expert on the subject of oil cake generally.

LINSEED CROP OF 1878.

The best crop of linseed in Ontario was that of 1878. It amounted to about 160,000 bushels. That was manufactured into oil cake in this country, and the greater part of the cake went to England and Scotland; there was little of the seed exported. That amount of flax seed represented about 3,500 tons of oil cake made in the Dominion. I have no figures of the quantities which came from the different Provinces, but the greater part was from Ontario. There is considerable flax seed grown in Quebec, but hardly any in any of the other Provinces; but quite recently the growth of flax seed of a very superior quality has sprung up in Manitoba. Its cultivation has been introduced there by the Mennonites.

LARGE EXPORTS OF OIL CAKE.

Of the 3,500 tons of oil cake manufactured in Canada, the quantity fed would be about 1,000 tons, and the quantity exported about 2,500 tons. Oil cake is used to a very much greater extent as a cattle feed in Great Britain than it is here; in view of the active and constant demand for it, I would judge that it is universally used there. We have shipped it at various times, and our shipments have never remained unsold for two days after landing.

IMMENSE DEMAND IN GREAT BRITAIN.

The demand for oil cake in Great Britain seems to be practically unlimited. The importation of flax seed into Great Britain in 1878, was 10,000,000 bushels. Fifteen per cent. of that came from the Black Sea and the Baltic, and the balance from India, in addition to which there was 230,000 tons of oil cake, besides cotton and rape cakes, imported into Great Britain. Cotton cake is said to be very useful for fattening cattle, but it is not good for cows.

EFFECTS OF OIL CAKE FEEDING—MANURIAL EFFECTS OF OIL CAKE.

As to the results of feeding oil cake to cattle, it is asserted that with stall-fed cattle, it produces eighty pounds additional weight to every hundred pounds of oil cake fed; and then the residue is of great value as a manure—very much superior to the manure from or-

[*Mr. Elliot.*]

dinary feed. In England it is valued at about \$18.50 per ton of oil cake fed. Oil cake is worth in this country from \$32 to \$35 per 2,000 pounds by the car load. In England it is a common thing to insert a stipulation in land leases that so many tons of oil cake per annum shall be fed upon the land. What I have been saying has been with reference to the use of oil cake for the production of beef.

EFFECT ON MILK.

As to its effect on milk, I am informed that the yield of milk is much more abundant and very much richer when oil cake is fed to cows which are kept on pasture. The quantity of oil cake fed per day to an animal is from $2\frac{1}{2}$ to 5 pounds with stall feeding, and from $1\frac{1}{2}$ to $2\frac{1}{2}$ pounds with pasture feeding.

To Mr. Edward Stock.—I would feed the oil cake mixed with other feed; it is too rich by itself, and should be mixed with bran or cut feed.

SMALL PROPORTIONATE USE OF OIL CAKE IN CANADA.

To Mr. Dymond.—The use of oil cake is not so general in this country as it is in England. If it were, we should require to use not only all our own oil cake, but a much larger quantity than is produced here. The English consumption of linseed cake is 430,000 tons, and, supposing that the population of the Dominion is one-tenth that of the British Isles, if our farmers consumed oil cake proportionate to the British farmers, they would require to use 43,000 tons instead of 1,000 tons; so that there is at least forty-three times as much oil cake used in Great Britain, according to the population, as here. To some extent we make up for that by the use of other feeds, but to a very limited extent. The use of oil cake in this country is confined almost exclusively to cattle, while in England it is used extensively for sheep, horses and pigs; good farmers in England use it for all their stock. They use it for fattening sheep to the extent of a pound or a pound and a half a day. I have not calculated to what extent the use of oil cake would increase the cost of feeding cattle in this country; information with regard to that is contained in a return sent to the Local Legislature by Mr. Brown, of Guelph, addressed to Mr. Wood. He goes considerably into detail with reference to experiments made with oil cake on the Model Farm at Guelph.

HIGH COMMERCIAL VALUE OF CANADIAN OIL CAKE

The oil cake manufactured in Canada always commands the very highest price in England, because the manufacturers here recognize the fact that in order to get a good price, they must remove the dirt and foul seeds from the oil cake. There are four mills in Canada for the manufacture of oil cake—two in Quebec and two in Ontario. In the Liverpool quotations, there is a difference of from one pound ten shillings to two pounds a ton in favour of Canadian cake as against the cake from the Western States. The cake is all analyzed in England and branded according to its quality, and Canadian cake is always declared to be of a superior quality.

SALES IN ONTARIO.

To Mr. Thomas Stock.—In Canada at present, I think we sell more oil cake to breeders of cattle and owners of good stock than we do to feeders; not much has yet been sold to those who are fattening cattle for market, but during the last year or so, since the British demand has sprung up, there has been more used. There is no doubt that the beef raised on oil cake is of superior excellence in the British market, and the English stock raisers say that the earlier it is commenced to be fed to the cattle the better they will turn out in the end. There is no doubt that the large quantity of rough feed used for fattening purposes in this country prevents to a certain extent the use of oil cake.

[*Mr. Elliot.*]

PRICES IN ENGLAND.

In 1878, I think the price realized on the average in England, was about \$50 a ton; that would be equal to about \$35 in Canada. In 1879 the price was lower; we did not realize more than from \$42 to \$43 a ton in England in that year, which is equal to about \$27 a ton here. This year the price has again advanced in England to what it was in 1878. We have realized as much as thirteen pounds a ton in some years in England. We always would prefer to sell in Canada, however, because we get the cash at once.

SEED FROM MANITOBA.

We got some two or three car loads of seed from Manitoba last year, and it was of most excellent quality, far superior to the Ontario seed. It has been introduced there from fresh seed imported by the Mennonites, who grow it entirely for the seed, while in Ontario the fibre is one of the principal items. There is not likely to be a surplus of seed for exportation from Manitoba for some time to come, because we import about 450,000 gallons of linseed oil annually in addition to what we make, and the protective duty of twenty-five per cent. on the oil is sufficient to induce our farmers to supply what is necessary for our own wants. I think there should be a large increase in the quantity of flax seed grown. The want of knowledge of the methods of cultivation has hindered the cultivation of flax seed in Canada to a considerable extent. I think that most of the cattle that have been sold at high prices for the Christmas and Easter markets here have been fed on oil cake.

OIL MILLS IN CANADA.

To Mr. Dymond.—I own a mill for the manufacture of oil cake, but I do not know, of course, what quantities of oil cake the other mills are supplying to the farmers of the country. Small quantities are obtained sometimes to be used as physic. The largest mill in the Dominion is Livingston's, at Baden; the next largest is that of Lyman, Sons & Co., of Montreal; the next is our own, in Beverley Street, Toronto; and the fourth is at Quebec. We have a capacity for a very much larger quantity than we make, in consequence of not being able to obtain enough seed.

INCREASED HOME DEMAND.

I know pretty well where the oil cake is consumed in this country, and I can say that practically the ordinary farmer does not use oil cake; at the last Industrial Exhibition held in Toronto, I distributed 5,000 fly-sheets to the farmers advertising the oil cake, and since that time the demand from the farmers has been larger.

LOSS BY EXPORTING INSTEAD OF FEEDING.

I have estimated that if the oil cake that is exported to Britain was fed at home, it would represent just double the money that is now sent to England in the shape of cattle, and that is why I say that 100 lbs. of oil cake will produce 80 lbs. of beef. Assuming that instead of sending oil cake to England, we fed it to our stock in this country, we should obtain 160 lbs. of meat for every 200 lbs. of oil cake; in other words, if the oil cake were sent to England as beef, it would bring back to the country twice as much money as it does by being sent as oil cake, irrespective of the manure which would be retained, and which is valued in England at \$18.50 per ton of oil cake. The value of manure from Indian corn is reckoned in England as worth about \$7, and the manure from turnips at about 60 cents to the ton of turnips fed; in other words, the manure from the oil cake is worth 250 per cent. more than the manure from Indian corn. The value of manure from peas and beans is in England as much as \$14, or about three-fourths the value of manure from oil cake. The first idea of the Ontario farmer in raising flax is the fibre;

[*Mr. Elliot.*]

the seed of course becomes an important element, but the oil cake is only the waste after the oil is pressed out of it. There is a constant sequence from the seed to the fibre, from the fibre to the seed again, from the seed to the oil, from the oil to the oil cake, from the oil cake to the cattle, and from the cattle to the manure, which employs labour largely at every stage.

FLAX GROWING.

To Mr. Thomas Stock.—I am decidedly of opinion that the seed for raising flax should be changed once every ten years. I think the seed at present used in this country is not so good as that grown several years ago; I think the Manitoba seed would be an excellent exchange; the seed we got from Manitoba was most excellent in size and cleanness, and gave a very plentiful yield of oil.

COMPARATIVE PRICE OF OIL CAKE.

To Mr. Dymond.—With regard to the comparative prices of oil cake and other feeds on the farm, oil cake would be worth about $1\frac{3}{4}$ cent a pound, corn not quite a cent a pound, and the peas nearly $1\frac{1}{2}$ cent; but neither of these will do so well for milk and fattening as oil cake. I don't think Indian corn for any purpose is as good as peas. The oil cake is solid food, having had all the water squeezed out of it, while if you take 100 lbs. of turnips, you will find that there is only about 10 lbs. of solid matter in them.

R. W. ELLIOT.

Sittings to take oral evidence, held at Seaforth, August 11th, 1880. *Present*—Messrs. McMILLAN (Chairman), and DYMOND.

MR. THOS. GOVENLOCK'S EVIDENCE.

A LARGE GRAIN AND GRAZING FARM.

To Mr. Dymond.—I feed a good many cattle and sheep. I raise a good many, but I buy them chiefly. I have a farm of about 800 acres, about 200 acres of which is in grain, about 100 in hay, and the balance in pasture, a portion in grass. I chiefly buy steers at three or four or five years old. I have over 100 head on pasture now. I bought them last winter, and they have been on grass since May.

ALLOWANCE OF GRASS TO EACH STEER—PRICES.

I allow each bullock about three acres of grass. In the spring, when they are thin, we like to get those that will go 900 pounds, but it is hard to get them so heavy. We give about \$3 a hundred for them, or \$3.50 for a nice one. We cannot graze more than about 150, but we sometimes buy a great many more, and send them to Buffalo to be fed up.

STEERS—GRADE CATTLE—WEIGHT.

Steers are the only animals we can ship to advantage. If we get a good grade in the spring weighing 900 pounds, we expect it to weigh 1,300 pounds in the fall.

PRICES IN ENGLAND—FREIGHTS.

We sell them in England for from 7d. to 9d. per pound. Freights just now are a little low. I heard a few days ago that they were as low as £3. I paid £3 15s., and I thought I was getting a bargain. Last spring they were as high as £5 or £6. Cattle do not bring so much in England at this time of the year as they do in the spring.

[*Mr. Govenlock.*]

SHIPPING ARRANGEMENTS.

I generally ship from Montreal. If we ship at Boston we have to slaughter them at the port of debarkation. In that respect we have a slight advantage over the Americans, but not much.

LARGE SHIPMENTS OF SHEEP.

I also send sheep to England. My son has 1,000 sheep over there now. They are principally Leicesters or the common mixed breed. I believe our farmers are improving their stock. I do not think they are introducing the black-faced sheep very much, although they are the best for the English market.

MUTTON A BETTER PRICE THAN BEEF—WETHERS.

Mutton brings a little better price than beef in England. There is a preference there for the meat of Southdown sheep. There is a difficulty in getting enough wethers in this country. If the farmers kept more wethers, we should be able to command better prices; but they sell off their lambs too much.

WEIGHT PREFERRED FOR SHIPMENT.

The most preferable weight for shipment is about 150 pounds live weight, which is equal to 75 or 80 pounds dressed. I believe a cross of the Leicester and the Southdown would be a good mutton sheep, though I have not tried it.

THOS. GOVENLOCK.

Sittings to take oral evidence, held at Fergus, August 14th, 1880. *Present*—Messrs McMILLAN (Chairman), and DYMOND.

MR. PETER RENNIE'S EVIDENCE.

PETER RENNIE, of Fergus, was called and examined.

BREEDING, BUYING AND STALL FEEDING.

To Mr. Dymond.—I farm some 210 acres of land in this neighbourhood. It is mixed farming I carry on. I pay particular attention to the feeding of cattle for market. We keep no thoroughbred stock on our farm, but breed from the best neighbouring herds. This gives me the choice of the best male animals.

SEASON AND AGE.

We mostly purchase animals at from three to four years old. We generally buy in the fall, just before stalling, and feed till May. Our object is to meet the demand of the foreign trade.

ONLY THE BEST GRADES.

We buy only the best grade steers we can get, the higher the grade the better. Steers of this class are a little scarce. I think that is because more farmers are going into feeding.

[*Mr. Rennie.*]

PRICES AND WEIGHTS.

To the Chairman.—We pay for such stock fully 4 cents per lb., live weight. We prefer them from 1,200 to 1,400 lbs.

To Mr. Dymond.—Common animals would not reach that weight at three years.

TURNIPS—WINTER FEED—PEAS PREFERRED TO CORN.

We raise a large quantity of turnips, and feed largely of them. We give the fattening cattle no straw. We give the turnips whole with hay and chopped grain. Peas, with barley or oats. We formerly used corn, but the price is now prohibitory. It approaches so nearly to the price of peas, that it is more economical to use peas. I prefer peas as a feed, weight for weight, to corn. The pea crop is not a failure with us.

DAILY EXERCISE.

We let the cattle out in the yard daily to drink, but for a short time only. The shippers like them to be strong in the legs, and this is gained by letting them out once a day.

DAILY ALLOWANCE OF FOOD—SALT.

To the Chairman.—We feed turnips twice a day, and at the rate, on the average, about $1\frac{1}{2}$ bushels per day per beast. The quantity of other food must be regulated by the condition of each beast. One animal will take a third more than another. If turnips are scarce we give them the hay cut with the chopped grain and damped. In the cut feed we give salt freely. I prefer this to giving salt in any other form. We use the Huron salt

INCREASE OF WEIGHT.

To Mr. Dymond.—A beast should come out 300 to 400 lbs. heavier at the end of the six months. A beast weighing 1400 to 1700 lbs. suits the shippers, but the larger weights are preferred.

To the Chairman.—We have tried artificial foods, but do not care for them.

USE OF OIL CAKE.

To Mr. Dymond.—We have used oil cake in the past, but not of late years, except to a limited extent. We do not depend on it. I am aware it is used in England almost universally for fattening purposes. I have not gone into the question of the value of oil cake economically, as a feed for cattle.

STEAMED FEED—MOLASSES.

I think the steam boiling of feed would be advantageous, if not objected to by shippers. We have used a little molasses, also steamed food, and found the cattle very healthy. I do not know the shippers would object. They judge of the beast at the time of purchase.

REGULARITY OF FEEDING.

To the Chairman.—We are very particular with respect to the regularity of feeding cattle. They are fed altogether four times a day.

FORENOON DIETARY.

First, at six a.m., on turnips, then with chopped grain, fed in a separate box for the purpose, so that none is wasted and the feed is never sour. They are then fed with hay, and allowed to rest.

[*Mr. Rennie.*]

WELL CLEANED DAILY—WELL BEDDED.

They are all curried carefully every morning. This is a most important matter in avoiding restlessness and irritation, especially in animals highly fed. They are well bedded with straw, as we want all the manure we can get. At noon they get some hay, and we have them turned into the yard for water and exercise.

AFTERNOON DIETARY.

Between three and four p.m., they get their turnips again, and more hay. We give the hay in small quantities in their mangers, so as to have it clean eaten up each time. They are fresh bedded and left till seven p.m., when they get their chopped grain or cut feed with a little more hay. They are then left for the night.

CURRY-COMBING—DURHAM GRADES EXCLUSIVELY.

We use a curry-comb made for the purpose, with larger teeth than the ordinary comb. We use Durham grades exclusively, in fact see no others in the market.

PRICES—PROFIT ON FEEDING GOOD CATTLE.

We sell to shippers. Have got on the average about $5\frac{1}{2}$ cents for our ordinary sales. We estimate that there is a profit on the fattening of the right kind of cattle, at the prices I have given, charging market rates for the feed. There would be no profit on feeding common stock.

COARSE GRAINS AND HAY AT FULL VALUE—MANURE.

In addition to the profit as between the cost and selling price, with feed at market rates, we get rid of all our hay and coarse grains at full market value on the spot, and enrich the farm by the copious supply of manure. That is the secret of our being able to feed so large a number of cattle on a comparatively small farm.

SIXTY HEAD IN A SEASON.

We have fattened nearly sixty head in a season, with only some ten tons of hay, and 300 bushels of peas, over and above our own produce.

GRASS FEEDING IN SUMMER—BRAN.

To the Chairman.—We sell no grain-fed cattle during summer. We sometimes, in order to secure a supply of the right sort of cattle, buy them six months younger, and pasture them till the fall. We buy only cattle partially fattened. I would recommend the use of a little bran with the feed.

BARLEY—PEAS—SPRING WHEAT—AVERAGE YIELD.

We grow barley largely, as well as peas, and generally some thirty acres of spring wheat. Fall wheat has not succeeded with us, although grown well by others. From 20 to 25 bushels per acre, would be about the average yield of spring wheat.

SALT ON THE LAND—GOOD EFFECTS.

To Mr. Dymond.—We use salt freely on the land as a fertilizer. We have used it for seven or eight years. It has a marked effect on the second as well as on the first year's crop, if it is applied to turnips. The effect is seen on barley or spring wheat the year following.

[*Mr. Rennie.*]

Turnips braird more freely when sown, and more vigorously altogether. The straw of the barley or wheat is firmer, brighter, and not so liable to fall over.

To the Chairman.—The grain I consider is plumper.

To Mr. Dymond.—We apply 250 to 300 lbs. per acre to our turnips, or wheat and barley crops.

ROTATION OF CROPS.

We carry out a rotation of cropping. Our usual rotation commences with peas after sod, followed by wheat or barley; then by oats, and then turnips. After this we sow wheat followed by grass for three years.

SUMMER FALLOW—FEEDING RAPE.

We generally put a field into summer fallow, and sow it with rape, which we use as feed in the fall, turning the cattle to be fattened on to it. Great care must however be taken, not to let the cattle go to it when it is in a damp state. We usually give the cattle a little dry feed before turning them on to it.

PERFECT QUIETNESS ESSENTIAL TO CATTLE.

It is an essential part to our system to keep the cattle perfectly quiet, and free from irritation of any kind.

NO ROUGH HANDLING OR ILL-USAGE—NO DOGS.

I allow no rough handling or ill usage, and all dogs are excluded from the farm, in order that the cattle may not be harassed by them.

PETER RENNIE.

MR. JOHN BLACK'S EVIDENCE.

JOHN BLACK, of Fergus, was called and examined.

A BUYER AND SHIPPER.

To Mr. Dymond.—I am a grain merchant by trade, but export cattle, sheep and hogs to the English, Belgian and French markets. I buy my animals in a condition for shipment. The cattle are mostly grain fed. There is a decided advantage in these over other cattle. I ship in May, June and July for Montreal. Fall shipments did not pay, nor could I get the cattle I wanted at that season.

GRAIN FEED—COMMON CATTLE—GRADES.

To the Chairman.—If cattle were fed with a portion of grain while pasturing it would make all the difference.

To Mr. Dymond.—We may sometimes ship common cattle, but the high grades bring two cents a pound more in England easily.

FOUR YEAR OLDS PREFERRED.

To the Chairman.—I should prefer cattle four years old, as being stronger and better fitted for the voyage; but three year old cattle well handled do very well. We have shipped a few at two years, weighing up to 1,300 pounds. These would be well-bred animals. Cattle should be turned out for exercise. The fact that they are often not so

[*Mr. Black.*]

treated frequently leads to trouble, especially if too large a proportion of turnips has been used in the feeding. The exercise given to American cattle gives them an advantage in this respect.

COMPARISON OF CANADIAN WITH AMERICAN CATTLE.

On Mr. Rennie's plan they do very well. I have bought large numbers both of Canadian and American cattle. Canadian cattle well-bred and fed, as described by Mr. Rennie, are quite equal to the best American steers, but we get too few of them. The American cattle, always out of doors, fed from the dam from their birth, and fattened on corn, have an advantage in firmness and quality over ordinary Canadian pasture-fed stock. If Canadian cattle are to hold a high position in the foreign market they must be well bred and fed liberally and judiciously. I think there are good prospects in the English market for well-fed cattle. The ice blockade occasioned a little difficulty to shipment in the spring, but we can generally get sufficient accommodation.

SHIPMENTS TO ANTWERP AND PARIS.

I shipped two cargoes to Antwerp, some of which were re-shipped to Paris. The cattle to Paris sold well. The first cargo sold in Antwerp was not well managed, but the second was satisfactory. My experience so far indicates that there is an opening for a successful trade with both France and Belgium. The cattle must be as good for those markets as for England, but not quite so heavy—the weight should be about 1,400 lbs. I was led to enter into the trade by the letter of Messrs. Munderloh & Co., the German Consul in Montreal, to the *Toronto Globe*.

SHIPMENTS OF 1880.

I have shipped this year, jointly with Mr. John Scott of Galt, 1,456 cattle, 2,013 sheep, and 576 hogs. The cattle were principally steers. Heifers will sell for as good a price as steers. They ship well, but must be handled a little carefully on the cars. That is all that is necessary.

THE SHEEP SHIPMENTS—PRICES.

The sheep shipped were largely ewes—there is a want of wethers. It would, in my opinion, pay farmers to keep their lambs till two years old, and furnish a supply of wethers. We paid about six cents per lb. for sheep, live weight, with the wool on, for good ones, but a little less for others that were inferior. They were mostly good crosses of the Leicester, mixed with the Cotswold or Southdown breeds. We like sheep about 150 lbs., live weight, dressing at about 75 lbs. For mutton I do not think the farmers could do much better than use the Leicester. At the present time the most profitable sheep for wool and mutton combined would be a cross of the Leicester with the Southdown; but that might change with the demand for wool.

MORE WETHERS IN DEMAND.

For a shipload of wethers of the class mentioned I could give a cent a pound more than for the ordinary shipments I have made. I think there are good prospects for a market for sheep in England. I formerly shipped cattle to the United States—mostly pasture fed. That trade is pretty much closed now. The hog shipments have paid well.

HOGS—THE SORT WANTED.

Canadian hogs ship well, and are healthy. A good fleshy hog, off the stubble, weighing about 200 pounds, live weight, just suits the English market. I have paid this spring five cents to six cents per pound for hogs, live weight. Much fat is not required for the English consumption. White hogs are of the class most suitable for this trade.

JOHN BLACK.

[*Mr. J. Black.*]

MR. ROBERT BLACK'S EVIDENCE.

ROBERT BLACK, of Fergus, was called and examined.

To Mr. Dymond.—I assist Mr. John Black in connection with the shipment of cattle.

THE BELGIAN TRADE.

I went over to Antwerp this year to superintend sales there. Our cattle were better altogether than the Belgian cattle. There are no feeders there of any consequence. I am informed that there are few cattle fed on the farms, the supply of meat in the cities being largely distillery fed. They draw their supplies largely from Denmark, Holland and the United States

COMPARISON OF CANADIAN CATTLE WITH OTHERS.

Our cattle compare very favourably with the Dutch and Danish, but not with the United States cattle, which are fed for market from their birth. With good men to sell there should be a fair chance for a satisfactory trade for Canadian cattle in Belgium.

BAD SYSTEM OF SELLING.

The system of selling there is bad. The cattle are sold at live weight subject to 20 to 30 hours' fast, and consequent shrinkage. This is equal to from 50 to 70 pounds per head. Still there is a market there.

SALES IN PARIS.

We sent 32 head to Paris. The market there was quite equal to the English quotations in London. Cattle for Paris would usually be shipped to Havre.

NO QUARANTINE—WEIGHT.

There are no quarantine regulations in Belgium or France as regards foreign cattle. About 1,400 to 1,500 pounds, live weight, suits the Paris markets. In Belgium a little lighter would be preferred, say from 1,200 to 1,400 pounds.

ROBERT BLACK.

Sitting to take oral evidence, held at Toronto, August 20th, 1880. *Present*—Messrs. EDWARD STOCK (Chairman), and A. H. DYMOND.

MR. RICHARD HALL'S EVIDENCE.

RICHARD HALL, cattle salesman, Liverpool, London, Manchester and Wakefield, was called and examined.

LARGE EXPERIENCE AS A SALESMAN.

To Mr. Dymond.—I do business as a cattle salesman in many parts of England. It is the custom in England for the cattle salesman to intervene between the principals in all large transactions, so that his judgment almost entirely regulates the buying and selling of cattle. As a rule we consult our clients, but some clients do not interfere in any way—Mr. Frankland, for instance, who was the first Canadian shipper I sold for, and who brought the first successful cargo into England at Liverpool by the *Manitoba*. There

[*Mr. R. Black.*—*Mr. Hall.*]

were a few, say from five to ten, came before that time in Allan's steamers, and there was also a cargo came the fall before in a steamer called the *Euphrates*; but they were a lot of middling cattle. I ought to be an expert in cattle. I was brought up as a butcher with my father and at the age of nineteen I went to sell for Verdon & Cullen as an assistant salesman. They used to sell sheep in little lots. I remained with them as salesman eleven years, and then I commenced on my own account. I have been examined as a witness before a Committee of the House of Commons both on the cattle trade and on the cattle plague; I have been examined twice. I have also been on several deputations to the Privy Council in respect to restrictions. When on a London deputation to which I had the honour of being elected there were only three of us to speak, and I was examined at some considerable length. Some weeks I have had as many as 900 head of cattle pass through my hands. I have had the largest number of Canadian cattle to sell of any man in England. When I was with Verdon & Cullen we had at certain seasons of the year very large numbers of sheep and lambs, and sold them in tens, twenties, thirties, and forties, and when dealers placed them in our hands to sell I was seldom told the price of any of them, but had to sell them according to my own judgment. Then, when the sheep trade fell off, in the month of October or November, I went to assist in selling the cattle. Besides the Canadian cattle that have passed through my hands I have sold large consignments of American cattle. When the root crop has failed I have bought in London and taken to Manchester and Liverpool large numbers of Oporto, Spanish, Danish, Swedish and Dutch cattle, and also cattle from Schleswig-Holstein. My observation extends very largely also to Irish cattle.

COMPARATIVE VALUE OF DIFFERENT BREEDS.

Of the cattle which come into the English market those which rank highest in point of quality are the Aberdeen Scot. They are the breed known as the Polled Angus. The Fat Galloway ranks about equal with the Polled Angus; but a middling Galloway is just about as bad a bullock for a butcher as you can select, he kills very coarse indeed. The Galloway will bring more per pound than any other breed, except the Aberdeen, but he does not cut as streaky as the Polled Angus. If you feed a Galloway bullock and a Shorthorn together, and feed them exactly alike, the beef of the Galloway will eat better than that of the Shorthorn, and it is the same with feeding Leicester sheep and Southdowns together. The Galloways are not the most paying cattle though. Next to the Polled Angus or Scot in point of quality I would put the English Shorthorn or Durham. The Bates blood ranks much higher than the Booth; but my impression is that for the butcher the Booth is the more useful animal, because it is larger and carries more flesh. Next to that breed I would put the American cattle, which my experience this year has shown me are nearly equal to the Scottish and superior to the Irish, with the exception of the prime grass Irish heifers. Then the Irish and the good Canadians rank about the same.

AMERICAN CATTLE BEFORE THE CANADIANS.

The American rank higher than the Canadian cattle, in the first place, I think because the breed is stronger. I think the Americans keep their cattle a year longer than the Canadians. The American cattle have big chines, and when they are killed the are thicker through the belly, and are generally better weighers. Some of the distiller fed beasts, however, have commanded high prices. The first importation of Canadian cattle into London came to me some five or six years ago—I think by the Temperly Line. There were one hundred and twenty of them landed on the Sunday at Thames Haven. I told all the London buyers about them, and induced reporters to come up, consequently they were noticed in the *Times* and other London newspapers. When they came to the market people were perfectly amazed that such good bullocks could come from this country. The consequence was there were crowds of customers for them, and we sold them for more than they were worth. Those who bought them over culled them, and then they said they weighed too light.

[Mr. Hall.]

PREJUDICES, AND HOW TO OVERCOME IT.

The Canadian bullock does not rank so high, however, as the American; they say they do not weigh so well; and they also say that they do not like the whiskey-fed cattle—that is the term that is applied to them in London. Finding much prejudice, I told the feeders engaged in that business to leave their tails long in future; they have done so, and since then they have ranked as well as anything. A short time ago I had a cargo of them in Wakefield. They came by the *Lake Winnipeg*, and were landed at Liverpool on the Tuesday evening. I had them in the Wakefield market on Wednesday morning, and all day I had swarms of buyers around me. The first-class Canadian stall-fed animal is not inferior to the American; but the distillery beasts do not rank so high. When I make the remark that the Canadian beasts rank second to the American I am speaking of the distillery cattle.

A STALL FED CANADIAN EQUAL TO ANY AMERICAN.

Q. Do you consider that a well-bred Canadian animal, stall fed, is equal to any you have obtained from the United States? A. Decidedly. The cargoes of cattle from the United States are better selected than those from Canada, because they keep the worst of their cattle at home, and what they cannot sell there they slaughter and send to us as dead meat. From what I can understand the American cattle are principally fed in *ranches* with Indian corn, and have sheds in which they can run during the winter. I think too that they are, as a rule, a year older than Canadian cattle, which assists them to weigh. The American corn-fed cattle rank in quality equal to anything in England except the Polled Angus and the Galloway. I might almost say, but that it is not desirable to go too far, that they are superior to any others. Many of the cattle I am speaking of are good grades—what we call a real good, useful butcher's bullock. They have bone; but you cannot get flesh without bone. If you get weak necks you will have weak chins. These cattle are animals that have been greatly improved by the use of thoroughbred Shorthorn bulls. The coat will tell whether cattle have been stall fed, pasture fed, or swill fed.

ADVANTAGE OF CANADIAN CATTLE.

In consequence of the pasture-fed and stall-fed cattle from Canada going through the country free they bring from a penny to three halfpence a pound more in hot weather than the American cattle which have to be slaughtered at the place of debarkation.

NO OBJECTION TO DISTILLERY FED BEASTS.

I do not object to beasts that are fattened entirely on swill. I was in Wakefield the following week, or the week but one after the time I have referred to, with some swill-fed beasts, and everybody there said that they had seldom seen better animals, but that they were sold very dear. There is no peculiarity about the meat of distillery fed beasts that is objectionable. That meat will salt as well as the American, but not as well as our English meat. I think that is the result of the harassment they receive during the long sea voyage, at the end of which they are scarcely in so prime a condition of health as when they left their homes. Animals are nearly always sold by hand and not by weight with us. We do not want to sell by weight; we want to sell the animals sometimes for more than they are worth. If they were to be sold by weight any person could go into the business.

GRAIN—POTATOES—DISTILLERY FEED—OIL CAKE.

In Canadian cattle I would give the preference first to the purely stall fed, and then to the distillery fed. The grass fed we have had but little experience of. What have come hitherto I call mean, middling cattle. If your farmers would

[*Mr. Hall.*]

give them six or eight pounds of oil cake per day it would improve them, and hold them together on the voyage. There are a good many common beasts among the Canadian cattle devoid of good breeding.

ADVICE AS TO QUALITY AND WEIGHT.

I would advise Canadian breeders to send to England none but good animals; they will keep themselves together best. When I have bought bullocks with good flanks and loins, particularly good flanks, and they have travelled from Liverpool up to London I have found that they looked well; but if I happened to buy a stalky animal and got it to the other end of its journey I hardly knew it. I think there is no bullock that sells better than one of 800 pounds, dressed weight—I can tell you nothing about live weight. Bullocks from nine score a quarter to eleven score a quarter are the most saleable in Liverpool; a bullock of from nine to ten in Manchester. In Wakefield you cannot have them too big if they are good. The weight preferred in London is 100 stone, or ranging from 95 stone to 105. 100 stone may be reckoned ten score a quarter. In London eight pounds go to the stone; they quote there by the stone. The weights that would be the most acceptable would be those of cattle which weigh alive on this continent from 1,350 to 1,500 pounds. The loose fat of your cattle will fetch exactly the same as that of the American cattle, but the hides will not.

AMERICAN ADVANTAGE IN HIDES..

Our hides in England are classed, and the heaviest weights bring the highest prices; and very few of yours come in the heavy weights, except the old oxen, and their hides are not so good. The Americans have a decided advantage over you in their hides on account of the weights being greater, and that superiority in weight is owing to the American cattle being heavier than yours. Nature provides a thicker hide for the bullock that is pastured outside than for the stall-fed animal. Offal is an important element in our trade. If a man is buying a good bullock he prefers a good hide.

MIXED CARGOES—SORTED STEERS—HEIFERS.

The greater proportion of the Canadian cattle are steers. When a mixed cargo of cattle comes to us we sort it, and put the old oxen together, and the biggest and the best steers together. We do not sell them as a cargo but classify them. It does not cause a deterioration in the value of the animals to send them in a mixed cargo. In London heifers are not liked, and in Glasgow heifers and cows are not liked. The best market for them is Liverpool. There is no objection to them there at all. On the contrary, on Monday morning several men will meet me there who are from Nottingham, Derby, the Potteries, and Manchester; and the Manchester man will ask for heifers, and the Nottingham man for cows and heifers. The reason that heifers are preferred in those districts is that they are said to be smaller in their bones than bullocks, and they can cut them up into smaller pieces; they have more retail markets for that sort of meat than other places. If heifers are good they do not suffer on a sea voyage any more than bullocks; I do not think they suffer so much, they are not so big, and they do not get rubbed so much. I do not think they are quieter—cows are quieter. The old oxen very frequently get rubbed very much in their rumps.

PROSPECTS OF FUTURE TRADE

I am sure the prospect of the Canadian trade is good in England, and that trade is going to increase each year. An advantage which you have is that the Americans are so heavily handicapped—to the extent of a penny or three halfpence a pound—on account of their cattle having to be killed at the port of debarkation.

[Mr. Hall.]

HEALTHINESS OF CANADIAN CATTLE—GOOD RESULTS.

If, by a change in the law in England, you were placed on the same footing as the Americans, your cattle would be depreciated in value to the extent of three pounds a head. I do not think you have anything to apprehend in respect of that matter however. The Americans cannot show a clean bill of health. The veterinary surgeons in that country admit that their cattle have pleuro-pneumonia and Texas fever among them, and while they have that, the English Government, whether it happens to be Conservative or Liberal, will put its foot on their being brought through the country. I was asked to go on a deputation to Earl Spencer for the purpose of asking for the restrictions to be withdrawn; but believing as I did that such an application would be utterly fruitless, I declined to do so. I believe that your main chance in the English market consists in your protecting yourselves carefully against pleuro-pneumonia and all other contagious diseases by which your cattle might be affected. My experience is that Canadian cattle are generally healthy; they have wonderful constitutions I think. Distillery-fed cattle cannot stand the same fatigue as those fed out of doors.

EXERCISE—BETTER FEEDING.

I consider it indispensable to cattle being able to stand fatigue that they have a certain amount of exercise. I think exercise would improve them for the foreign trade. It is my opinion that you must use more artificial feed and roots for your cattle; and if you do you have many of the breeds in Canada as good as they have them in the United States. If you use artificial food you can have as good cattle as the Americans. I did not mean to say that if you were put on the same footing as the Americans your trade would be annihilated, but that your price would fall and you would be put at a considerable disadvantage. Assuming that your farmers pay great attention to getting a high class of animals, thoroughly well-fed beasts, stall-fed ones, you will command as good a price for them in our markets as other English breeds.

AMERICAN CATTLE ON LANDING.

The American cattle land, as a rule, in good condition—better than the Canadian cattle. This is due, in the first place, to the fact of the American boats being larger and better than many of the Canadian, and, in the second place, to the fact that the cattle when on board the American ships receive the same food that they do in America, that is, corn. You see hardly any cattle coming off the American ships rubbed on the rump. This, it appears to me, is because they have larger stalls than those on the Canadian vessels.

IMPROVED SHIPPING FACILITIES FROM CANADA.

Some of the Canadian lines are now, however, making arrangements for carrying cattle which are very favourable.

THE BEST SEASON FOR SHIPPING.

The best time of the year to send cattle to England from this country with a view to obtaining the best prices is in the spring, in May or June; if the St. Lawrence opened a month earlier, in fact, it would be all the better. The reason that they fetch better prices at that time is that the stall-fed cattle in Ireland and England are getting exhausted, and the grass-fed cattle are not ready. The only cattle that are coming then in quantity to London are the Norfolk, and they are the second crop.

Oporto AND SPANISH CATTLE.

Some of the Oporto cattle going into London are very good indeed; butchers favour [Mr. Hall.]

them because they have very extraordinary hides on them. The Jews in London favour the Oporto and the Spanish cattle very much. All the Oporto cattle are sound. If the Jews do not get the meat *cosher* they reject it as *trifel*, and then the butcher has to send it to some man in the metropolitan market to sell. Consequently there are no cattle in greater demand among the Jews than the Oporto.

DEAD MEAT IMPORTATIONS.

I do not think the importations of dead meat have been very successful. I have been offered two commissions for the sale of it, but I would not take them, because, I said, I thought they would end in disappointment, and I did not want to take a shipment on which I thought the consignor was going to lose. The shipment of dead meat affects the London market more than any other. In London it is not as it is in the inland towns or in Liverpool in this respect. In London the butcher goes for orders every morning to the whole of his customers, and if a man only wants a pound of steak, his order is sent to him. It is a daily supply, so that if the meat is in fair condition the coarser parts are disposed of for beef *à la mode*, soups, hashes and stewing, and the better parts are sent to various private houses, hotels and restaurants, and there is an immediate consumption of all parts of the animal; whereas in Liverpool or any of the Midland counties—in Derby, Nottingham, Sheffield, Wakefield and other places—many consumers will not have the refrigerated meat—they will come and buy a worn old fat cow, or a bull in preference.

AMERICAN DEAD MEAT.

The American refrigerated meat eats tender; but I think it is tasteless. The American cattle killed at Liverpool and Birkenhead have, however, grown in favour a good deal in many parts of the country, because of the railway companies having made better arrangements for the rapid and successful conveyance of meat. In that way Canadians have been losing a little of the advantage which was given them by the obligation to slaughter American cattle at Liverpool. There has not been so much change in that respect in Wakefield or Liverpool; but from Manchester we have not so many buyers as we used to have. Some of them say now, "There is so much difference in the price that we will go down to Liverpool and buy some Liverpool or Birkenhead-killed American beef."

USE OF OIL CAKES—ROOTS.

I am very favourable to the use of oil cake as food for either stall-fed or grass-fed animals. It is now universally used by farmers in England and Scotland. Canada exports large quantities of it to England, and the Canadian oil cake is highly appreciated there. In feeding oil cake I would begin with three or four pounds and finish with eight pounds a day; a large animal would take a little more. In a large city like this, where they are feeding so many in stables, manure is of no value, but in the country it is, and nothing makes so good manure as oil cake. I would also recommend oil cake for distillery cattle. We have had a few distillery cattle which were a grand lot of animals; they were choice cattle. Everybody gathered round and admired them; but the butchers were a little shy of them. They said the beasts were a good quality, but the price demanded was a little too high. During the last two or three years the character of the cattle shipped from Canada has decidedly improved, and their reputation has made rapid strides. I would strongly advise the introduction of oil cake as a food, first, on account of its nutritious qualities, and in the next place, because it is a food that can be continued during the sea voyage. Distillery-fed cattle can be given meal and slops on the voyage, and they consequently arrive in fair condition. A thing that I would suggest to your farmers is that they should grow swede turnips and mangold wurzels; they are an excellent thing to give cattle in the winter, the swede first, and when it is done the mangold wurzel. The mangold wurzel ought to keep till the middle of summer.

[Mr. Hall.]

UNWISE ECONOMY.

I have met with a great many Canadians, and I find that some of them "put it in at the spigot and let it out at the bung hole." They are afraid to put their hands in their pockets to purchase the food which their cattle ought to have. When they come to our side and we propose to give the cattle some meal they say, "Don't give them any meal; a bit of hay will do;" but if we have Canadian cattle in our possession a day or two and give them meal, it makes them look pounds better. In this climate I would recommend turnips judiciously given; I would give turnips, a little meal, and oil cake.

DURHAM AND POLLED ANGUS CROSSES.

For the purpose of getting good grades I would recommend your farmers to cross your native cattle mainly with Shorthorns, and only to cross once. I would also recommend the Polled Angus as an animal for improving your stock; I think the Polled Angus crossed with the Shorthorn would give you an excellent animal for the butchers—that is, one cross. I would take a thoroughbred Shorthorn cow and cross her with a Polled Angus bull. I would also cross the Polled Angus with your native cows. I do not think thoroughbred steers sent over to England would fetch any more than other cattle. Whether you would succeed in making anything better than a Shorthorn I would not venture to say, because you have sent some extraordinary cattle into England.

THE SHEEP TRADE.

Large numbers of Canadian sheep pass through my hands. They do not rank well in the English market. The reason is that most of them are rams and ewes, and the ewes, as a rule, are old sucked-out animals. Some of them you can get fat, but cannot get them to take on flesh, and the consequence is that they are light on their loins. Mutton of that sort does not sell well.

THE WEIGHT PREFERRED—WETHERS INDISPENSABLE.

The weight of sheep preferred for mutton varies from 60 lbs. to 90 lbs., according to the class of customers. From 70 to 80 lbs. is a capital weight to get. A thing that you ought to implore of your farmers to do is to send the rams as wethers. Buyers come to market and look at lots of sheep, and when they find that there are no wethers in them they walk away. For the ordinary family butcher wethers are indispensable—wethers or gimmers, that is, ewes that have had no lambs. In England in my early days the better class of people all wanted four-year-old mutton. There is no such a thing to be had in quantity now-a-days; it is all early maturity. There are lots of young sheep sold in the London and Liverpool market one year and a few months old at from three pounds to three pound ten per head.

MERITS OF DIFFERENT BREEDS.

We obtain early maturity in England now in sheep as in cattle by special feeding. For mutton there is no sheep so objectionable to us as the Cotswold; we want mutton that is lean—plenty of flesh—juicy mutton, ripe and lean. For mutton the Southdown is first, the Shropshire Down is the second in quality, the Cheviot or Scotch are the third. The Southdowns do very well in a warm climate; but if they are sent to cold climates they become small and puny, and degenerate. I think they have got the Southdown too fine now; they have got too much of the Leicester in them. Often at Christmas I have had one or two of them for show, and there has been very little lean in them. Southdowns deteriorate in the north of England, in Scotland and in Ireland. In Ireland they use mostly the Shropshire Down for crossing. The Oxford Down has not been very much used.

[*Mr. Hall.*]

It is larger than the Shropshire. It would not be too large for our market. With us, if you have quality and size combined you will find plenty of demand. It would not pay you to send us pure Oxfords, but cross the native sheep here with the Oxfords.

THE SHROPSHIRE RECOMMENDED.

A few years ago a Mr. Aungier, of the firm of P. Leonard & Co., had a lot of Shropshire Downs from Ireland and a lot of Lincolns in the market the same morning. The Shropshire Downs did not weigh so heavy as the Lincolns by five pounds a quarter. There were a dozen people there early to buy the Shropshire, but, in the afternoon, although he begged and implored people to take the Lincolns for ten shillings less than he sold the Shropshires for, they would not buy them. I do not think there is any animal so serviceable as the Shropshire. The Shropshire would cross wonderfully well with your Leicester. I object to the Leicester as a mutton yielding sheep; but the cross improves it, because the Leicester is a sheep of very nearly the same type as the Cotswold. If you were to use the Shropshire ram for crossing with Leicesters or good grade sheep, that would produce just the mutton we want.

WETHERS OR GIMMERS ALWAYS.

Then let the animals you send be wethers or gimmers in all cases. If you sent over a mixed shipload of sheep and at the same time sent a thousand well selected wethers, there would be, I think, a difference of 10 shillings a head in favour of the wethers, and you would have twenty buyers for them where you would have one for the others—you would have all the select buyers after the wethers.

MERINOS NOT APPROVED.

We are getting large numbers of sheep from the United States. They are sending us from that country a very fine class of Merinos and some others, but principally Merinos. I have seen some of them weighing 90 and 100 pounds. They are very ripe and full of fat. They are not profitable meat for the butchers, being too full of fat, and they are short of flesh. Canadians rank well with the Americans in regard to their capacity for sending to England a good class of sheep, but they do not work with them in regard to sending wethers. The Shropshire Down is a particularly nardy sheep. If you cross the Shropshire with the Leicester you get a very popular wool.

BLACK FACES AND LEGS POPULAR.

Buyers of sheep for the purpose of mutton do not calculate on the wool at all; they look at the face of the animal, and if they see some gray or black there they like that. In lambs also they do not like the white-faced; they want them with the stain of the Down in them. Butchers sometimes leave the skin on the legs of the carcasses of sheep in order to show what they are, because if they have Down in them they are worth so much more a pound. I think the Shropshire Down would be better than the Oxford or any other sheep to cross with your common ewes. The Shropshire Down is low on the legs and you will get more flesh on him.

HOW TO JUDGE A SHEEP.

In examining a sheep most people touch him by spreading the hand across the loins; but I choose them by touching them with the ends of the fingers in the middle of the loins, and I can then tell in a moment whether there is flesh there or not.

[Mr. Hall.]

PIG FANCYING.

I was for many years a great pig fancier and won many prizes at home. I have two silver cups that I won in that way. I had promised to judge pigs and sheep for two societies at agricultural shows; but coming away from Liverpool I had to write and apologize for not being able to do so because I was coming over here.

THE PIG THAT IS WANTED.

I like a pig as straight as a Leceister sheep, good short nose and good jowls, and I want them good behind the jawl. If they are such animals as that, then they are like all other animals, good to follow and good to meat, good in their hair, good through their hams, and good on their loins. I have often seen pigs at our shows that I would almost term malformations, extraordinary forward and good in the hams, but very weak in their loins.

THE MIDDLE BREED YORKSHIRE.

The pig that I think the most profitable that any man can breed is the middle bred white Yorkshire with plenty of hair. In this country you want pigs with plenty of hair or they will get scorched by the sun. Length is desirable in a pig, because when you get length you get well mixed bacon. The taste of people of means in England has always been in favour of bacon with lean in it; and now country people too require finer bacon than they used to—they want a meaty pig rather than a fat one. There is no one who has been so successful in raising pigs as the Earl of Ellesmere and Peter Eden, near Manchester. They have been wonderfully successful with their pigs. I think the Berkshire breed is a very fine one, and I am led to believe that it makes the best bacon; but I do not think the pigs of that breed are as quick growers as the middle-sized Yorkshire.

THE WEIGHT NEEDED.

In England for bacon purposes we like a pig to be about nine or ten score. We kill them at eleven and twelve score—that is dead weight. We get them to that weight very early.

WASHING—HOUSING—FEEDING.

I used, when I was breeding pigs, to have them washed every week, and I always kept them warm. As to feeding, though you will not make the best bacon, you will turn the pigs off a month earlier by feeding them with boiled man-gold wurzel and boiled Indian meal together; nothing will make them grow so fast. Cheese factory whey or skimmed milk or buttermilk are capital things to give pigs. I used to give mine sweet milk for a month before showing them. If you are sending your pigs to the English market all that you want is to get early maturity; get the greatest quantity in the shortest time. Give the pigs their food in small quantities but often, so that you may avoid their getting it mixed with filth. With cattle and horses as well as with pigs the great secret in feeding them is to give them small quantities often. After the middle bred Yorkshire pig I would choose the Berkshire. I believe in producing what will pay, and that is early maturity. The pig for showing wants exercise. As a rule when people intend showing pigs they cram them with food without allowing them to have any exercise, and the consequence is that when they come to exhibit them their legs are underneath them and they are like the shape of a mouse instead of being straight all along like a Leicester sheep. They need a little exercise every day. When I washed my pigs I used the finest soap that was not scented. Many people wash their pigs with soft soap, which is an irritant. If you will use the other soap you will get the hair fine and silky, and that is a great thing.

[*Mr. Hall.*]

RICHARD HALL.

Sittings to take oral evidence, held at Perth, October 12th, 1880. *Present*—Messrs. E. BYRNE (Chairman), and A. H. DYMOND.

MR. JAMES DONALD'S EVIDENCE.

MR. JAMES DONALD, of Dalhousie, County of Lanark, was called and examined.

TRADE IN SHEEP.

I buy sheep for the American market. Any fat sheep or lambs suit that demand. The Americans will take all we can send. I sent between 9,000 and 10,000 myself last year, and expect to send 11,000 this year. I ship to Boston and New York and elsewhere. I give from \$3 to \$7, or more. It depends on the weight. Anything fat will suit. We should prefer well-bred sheep if we could get them. Our purchases extend over portions of the counties of Lanark, Renfrew and Carleton.

MORE WETHERS WANTED.

A great loss accrues owing to the farmers not making wethers of their lambs. I should say the three counties lose over \$10,000 a year by this means. The eastern market is supplied for about four months from Chicago with lambs, then from the Middle States about another four, and then from Canada and the Northern States for the rest of the twelve months.

SEASON FOR SHIPMENT.

We usually begin to ship in September, and continue in October, November and December, up to Christmas. The farmers are beginning to alter the lambs. There are several other shippers besides myself. The firm I was connected with shipped 32,000 head last year. The buyers would give a cent a pound more for a selected shipment of wether or ewe lambs than for ram lambs.

THE BEST MUTTON.

The best mutton lamb is got from a common or grade Leicester ewe crossed with a Southdown ram.

USE OF RAM LAMBS.

The use of ram lambs is also a source of great loss, owing to the ewes missing. The rougher sections of this district could be much more largely utilized for sheep-raising than they are at present. I think sheep more profitable to a farmer than horned cattle.

JAMES DONALD.

Sitting to take oral evidence, held at Toronto, Oct. 21, 1880. *Present*—Messrs. BROWN (Chairman), AYLSWORTH and DYMOND.

MR. ALBIN RAWLINGS' EVIDENCE.

ALBIN RAWLINGS, Forest, was called and examined.

I have had experience in stock raising. The largest farm I ever carried on contained 800 acres, but at the present time I am grazing only on about 300 acres. I have been farming about twenty-eight years in Canada in a general way, living during that time in the county of Lambton. Most of the land had been taken up when I went there. Recently I was a breeder of sheep and cattle for some years, but have now given up that business.

GRAZING IN LAMBTON—AGE AND WEIGHT.

I pay all my attention to grazing. I buy the cattle when they are two or three years old. If I buy them in the fall I buy them at two and three years of age, and if in the spring I buy only cattle three years of age. The cattle I purchase in the spring I put in the pasture about the first of April. I like to have them weigh at that time from 900 to 1,200 pounds, that is when they are three years old. We buy the best grades we can get.

SCARCITY OF GRADES.

The grades are scarcer in our part of the country than they were. I used to ship 600 stock cattle to the States every year; and now instead of that we have to import them into the county.

SPRING PASTURING.

I leave about one-fourth of the grass on the ground in the fall, so that in the spring I have that old grass, and can get my cattle earlier on it. They eat that grass by the middle of May, and then the young grass is stronger and better. The soil on my farm is a sandy loam, clay bottom, and gravelly loam.

PERMANENT PASTURES.

My pasture has been down from ten to twenty years. I have been trying experiments in regard to pastures. First of all I just sowed clover, timothy and white clover. Since that I have found out that I can grow more grass by mixing more.

MIXED GRASSES—PROPORTIONS.

And now I claim that for a permanent pasture the best grasses to sow are the following:—three pounds of red clover, two and a half pounds of alsike, half a pound of white Dutch, five pounds of timothy, three pounds of Irish cocksfoot, three pounds of orchard grass, and about two pounds of lucerne. This is the proportion for one acre; and makes it permanent grass, and one that will take in the soil.

TIME FOR SOWING.

I have been sowing timothy in the fall latterly. I would recommend to have the land in a proper state of cultivation and to sow down without any crop.

I put my cattle to graze the first year of sowing. On the best pasture I have I sowed the timothy in the fall, and the other grasses in the spring. I would recommend by all means to sow the grass seed in the month of March when the land is very dry and the

[*Mr. Rawlings.*]

earth is full of creases. The seed falls into the cracks, and when rain comes the earth fills over them. This year I advised a person to sow his grass about the 8th of March, and it has caught very well all over the field. My permanent pastures, thus laid down, have lasted twenty years, some of them.

ALSIKE FOR MILK CATTLE.

The alsike remains the best grass we have in Canada for milking or grazing purposes.

TOP DRESSING.

To keep up the fertility of the pasture I recommend top dressing with either leached ashes or any manure you can get. I would not recommend any special manure. Land plaster is not so good as ashes, on light soil. Where we have done top dressing we have got twice as much grass.

GROWTH OF THE GRASSES.

After the first year the clover begins to give out. The orchard grass and cocksfoot are up about eighteen inches high when the timothy is only about four inches, and the cattle get this first, and then the timothy comes on and the alsike and white clover. The grasses I have recommended above come up at different periods, and they make a good bottom, and where you have a good bottom you have a good pasture. The timothy I think stands the drought the best. I haven't had any hay from these pastures for three or four years. I got a great deal of experience about grazing in New York State, where they leave one-third of the grass on in the fall, so as to let the cattle on early in the spring.

CATTLE ON ROUGH GRASS—PASTURE FED CATTLE.

In the spring I first put my cattle on where there is rough grass. Last year I put them on in the last week in March. I find that the cattle on this grass, and hay, will gain as fast as if they were in the stable, and fed with meal and turnips. The heaviest I ever knew a steer to gain in one summer was 700 pounds. This animal was fed only on grass. I don't feed my animals on anything but the grass; I give them no meal at all.

WINTER FEED.

I would recommend farmers here to feed their cattle pretty well during the winter. One of the best things to feed them on in the winter is corn and straw cut into chaff with a little meal twice a day. Cattle thus fed in the winter will come out in the spring far better.

TIME TO SELL CATTLE.

Our farmers should hold their cattle till all the distillery cattle are shipped. They should not sell their cattle till July. The cattle should be allowed to have the whole pasture from spring till fall.

CHANGE OF PASTURE NOT EXPEDIENT.

They should not be changed from one pasture to another. It is a great mistake to do so. I have tried the experiment; a man I knew changed his cattle to different pastures every week; I allowed mine so many acres for the whole summer; the result was that mine sold for \$8 dollars a head more than his. I attribute my increased price to not changing the pastures. I observe when you put fresh cattle in fresh pastures they will eat and gorge themselves, and afterward they will not be able to eat. When you keep them in the same pasture they eat regularly and do much better.

[*Mr. Rawlings.*]

NUMBER OF CATTLE PER ACRE.

The number of cattle you can pasture per acre depends altogether upon the state of the pasture. The farm I have had for nine years will pasture twice as many cattle now as when I got it. I like to pasture about 30 cattle to the 100 acres, about three and a half acres to each animal. In judging of the number of cattle suitable for a farm a person ought to be guided by the seasons.

PRICES PAID AND REALIZED.

Last year I paid on an average for my cattle \$33.28 a head. The average weight of them then was 950 pounds. The average increase from April would be about 300 pounds. This season the price of cattle has been high. An average price for selling the animals would be from $4\frac{1}{2}$ cents to $4\frac{3}{4}$ cents a pound. The cattle I sold this year averaged me \$55. I have not lost any cattle by death for some years. The most I ever lost was three in one season.

COST OF GRAZING—RENTAL OF GRAZING LAND.

There is not much outlay in attending to the grazing of cattle. You can get grass to rent for \$3 an acre. I am renting some now at that price. Each steer costs me from \$8 to \$10 for five months' feeding. I have only 200 acres of rented land, and that is all in pasture.

RECUPERATING IMPOVERISHED LAND.

It was a run-out farm when I got it, and I seeded it down, and of course it is rich now. I didn't manure it at all. After my lease was out the rent was raised double of what it was. I find some difficulty in getting the required number of cattle in the spring; there are so many grazing that we find it hard to get enough of the kind of cattle we want. One cause of the good pasture on my place is the droppings of the animals, and the land of course is getting richer all the time.

MEAL FEED FOR CATTLE.

In feeding animals meal I prefer mixed meal. The more mixture there is in it the better. There should be several kinds of meal, and one quarter of bran.

NONE BUT DURHAMS OR HEREFORDS.

The two classes of animals I prefer for my purposes are Herefords and Durhams. If I could have my way I would have all other animals except Herefords and Shorthorns excluded from Canada.

A GOOD WORD FOR HEREFORDS.

There is no doubt in my mind that the Herefords are better than the Durhams. The Americans are getting our best male Herefords, and our farmers are losing by it. Some of our agricultural societies have not properly encouraged Herefords. There is a large quantity of Herefords in Quebec now. They are becoming popular more and more, and are being shipped very fast. Their merit is that they are hardier and keep in good condition. When they are milking they keep in good condition, and after they become dry they are beef in about two months. I had half-breed Hereford cows this summer that put on more flesh in six weeks than any other breed I had did in nine weeks. They are very fast feeders on pasture.

[*Mr. Rawlings.*]

HEREFORDS AHEAD OF DURHAMS ON PASTURE.

I had Durhams and Herefords together in the same pasture this year. On pasture the Herefords get far ahead of the Durhams. I think the Hereford bull has the same power of stamping his own merits upon common cattle that the Shorthorn has. I would like to see Shorthorns and Herefords both equally encouraged as a means of improving the common stock of the country.

NONE BUT PURE-BRED MALE ANIMALS.

We should try and impress on the farmers of the country to use none but these good animals. They always look at the cost of putting the cow, and never look to the price a steer would bring when three years old. Where I have been able to buy them I gave a large price for these good ones to encourage farmers to raise them. The difference between the price of a common animal, a fairly well raised common steer without any trace of blood, and a good grade Hereford steer first cross would be from one-half to three-fourths of a cent a pound. It is cheaper to give \$40 for one kind than \$30 for one of the other kind.

HEREFORDS COMMANDING GOOD PRICES.

I have seen Herefords in the United States market outsell anything else, by from one-quarter to one-half cent a pound. I should say that in proportion to bone and beef the Herefords have a little less bone. The worst feature you can find against them is that they are a little heavier in the fore quarter. You can't get a Hereford of three years old as heavy as a Shorthorn.

THE QUESTION OF SHRINKAGE.

The cattle I shipped are generally taken at once from the grass. They don't fall off much in weight during the voyage. I think they lose more in weight from my place to Point Levi than from that place to Liverpool. I have known Canadian steers to gain 50 pounds between Montreal and Liverpool. Any cattle that are quiet and are nicely handled will gain, and for this reason we should encourage pure-bred cattle. Pasture fed cattle are a little more troublesome in this respect than stall fed ones; but if you have pure blood in them they are never very wild.

OIL-CAKE—WATER—SHADE.

I think oil-cake would serve as a good preparation for the voyage, but it is expensive to feed with it. I don't look so much at the expense of the oil-cake as at the manual labour required in feeding them. I like grazing animals to have all the water they can get, and to have plenty of shade. I defy any man to make fat cattle without shade. I have a bush on my place. For a well sheltered farm I would give a dollar an acre more rent than for one exposed. I have not cropped at all these last four years. I gave up general farming four years ago, because it didn't pay as well as grazing.

SHEEP—SHROPSHIRE AND HAMPSHIRE.

I would like to say something in regard to sheep. I was a breeder of Cotswold and Leicester sheep for some years. The sheep I recommend are the Shropshire and Hampshire Down sheep. They seem to do fully as well in this country as in England, and their meat is worth a penny a pound more in Europe, and they are better shippers. I would recommend crossing our Canadian ewes with all Downs, Southdown, Oxford Down, Hampshire Down, etc. I prefer the Shropshire and Hampshire Down sheep because they have a heavier carcass and have more wool, which is, however, a little coarser. There is a difference between the size of the Southdown and the Shropshire Down.

[Mr. Rawlings.]

SHEEP FOR GREAT BRITAIN.

I ship sheep to Europe. The best weight for shipping is 60 pounds dressed weight, about 15 to 18 pounds to the quarter. Sheep of that weight, fat, bring the best prices in England and Scotland. The sheep I had there the first time weighed 21 pounds a quarter. They were the largest in the market, and were considered a little too fat.

DOWN SHEEP FOR CROSSING NATIVE STOCK.

I am of opinion that a cross of the Down sheep with the common sheep would be a great improvement in the sheep of this country. There are a good number of Hampshire and Shropshire Down sheep in the States, but they are scarce in Canada. We have a great many Southdowns here.

THE OXFORD DOWNS.

I know something of the Oxford Down. I don't like the quality much better than the Southdown. I have seen sheep got by crossing common sheep with an Oxford ram. They had the attributes of the male animal stamped on them. These attributes, however, were not so marked as were those on the female side.

BEST TIME FOR SELLING SHEEP.

The most profitable time for farmers to sell their sheep is after they have taken the first wool. I would advise them to keep their lambs during the winter, take the first wool, and sell them after July. That would bring them the most profit.

TRADE WITH THE STATES IN LAMBS.

There is some trade going on between our part of the country and the United States in lambs. Just now there is no money in that trade, but we are in hopes that as the weather becomes colder the trade will get a little better. It would be more profitable for farmers not to sell their lambs, but to keep them until they are yearlings, and then send them to Europe.

WETHERS MOST PROFITABLE.

It would be a great boon to the country to get our farmers to castrate their lambs. I think Ontario is losing half a dollar a head on every buck lamb they ship to Europe or the United States. They have not a back on them, and in fact they are nearly unsaleable in some seasons of the year, and they are scarcely fit for table use. In buying lambs I would prefer to have the tails cut off and have them altered. As long as the ewe has not been used for breeding purposes I don't object to it at all. If the ewe has had lambs she is about a cent a pound less valuable.

INDIAN CORN A PROFITABLE CROP.

I would highly recommend the raising of Indian corn, especially in western Ontario. I think there is as much profit in one acre of corn as in two acres of fall wheat.

GOOD FOOD FOR STOCK.

By cutting it when there is a gloss on the corn and curing it, housing it, and afterwards cutting it into chaff—corn, straw and all—a food is made which the cattle can eat without waste. Cattle fed in this way come into the market much better and heavier. A man who had fed his cattle with this during two winters sold them when three years old weighing 1,625 pounds, at five and a half cents a pound. There is no doubt that this feed is the best feed for fattening cattle.

[Mr. Rawlings.]

MACHINES FOR CUTTING CORN.

The cost of a machine for cutting the corn is from \$40 to \$45. There are several kinds of machines. Maxwell, of Paris, has one, and there are lots of them all over. If farmers would feed their cattle corn prepared in this way, it would pay them greatly. I have known 80 bushels of shelled corn raised to the acre in our county, and even more.

PREFERENCE FOR GRAZING.

I went from general farming into the special business of grazing, because of it being more profitable, and because there was less manual labour. Stock grazers like myself could not undertake to buy young lambs and feed them through the winter. It would take too much to keep them around the place. If we had the breeds I refer to these lambs could be shipped to Europe. Down lambs could easily be shipped to Europe. The Downs are a very strong and lively sheep. They would make a pretty good living where other sheep would starve. I would object to selling any calf that had Hereford or Short-horn blood in it.

WHAT IS GOOD FOR THE COUNTRY.

I think for the good of the country the Commission should express strongly to farmers to feed their cattle the winter before fattening them, to have them in good condition as soon as our distillery cattle are out of the country. My brother has been selling cattle three years old at \$80 each.

WINTER TREATMENT.

When the animals are fed well in winter they do better in the pasture. There is no doubt turnips are good, but our farmers can't be got into the way of growing them enough. Cattle don't do as well when they have been kept heated to extremes. I advise stables or sheds for cattle; the building in which they are should be closed. No person should sow an acre of grass down without alsike in it. I have cut hay sometimes from my pasture, it being mixed with clover and timothy. I got about the ordinary crop per acre, from one and a half to two tons, but the hay was better.

ALBIN RAWLINGS.

STATEMENT RELATING TO DISTILLERY FEEDING, BY J. P. WISER, M.P.,
A MEMBER OF THE COMMISSION.

A. H. DYMOND, Esq.,

Ontario Agricultural Commission, Toronto.

Dear Sir,—In response to your request I will now try to give you the desired information in relation to Distillery Fed Cattle.

GOOD GRADE STEERS—WEIGHT.

For feeding purposes good grade Durham or Hereford steers, three and four years old, weighing from 1,100 to 1,200 lbs. are the most desirable, and distillers ought not to feed any lighter cattle.

[Mr. Wisser.]

SPRING WEIGHT.

They will then go out of the stables in the spring weighing fifteen and sixteen hundred pounds, which, in my opinion, is the most profitable way to ship, as it costs no more to freight a 1,500 lbs. bullock than one weighing 1,000 lbs., making a saving of 50 per cent. in the freight alone—a very large item in shipping a large number of cattle.

METHOD OF FEEDING.

As to the method of feeding after going into stable, my plan is as follows:—

DAILY ROUTINE IN THE STABLE.

At six o'clock in the morning they are fed hay, all they will eat up clean in two hours; at eight o'clock they are fed wash from the distillery; at eleven o'clock again fed wash; at two o'clock hay again; at, say, five o'clock the troughs are filled with the wash and all the hay they will eat through the night, making six feeds in the twenty-four hours, three wash and three hay.

THE MARKETS.

As to the markets and the time for shipping:—

When I came to Canada, twenty-four years ago, the market for our cattle was mostly in Montreal and Quebec, a few going to the States. After a few years the production was greater than the demand, and then Boston was the principal market for our surplus stock. For about fifteen years I marketed my cattle in Boston, where we had a good and paying market, as long as reciprocity existed between the two countries. After that ceased to exist, we found the duties (20 per cent.) took off a good deal of the profits. But, during the war in the States, prices were so high that we could still send our cattle to that market and get far better prices than we could at home. I have sold cattle in Boston as high as 11 cents per pound, live weight. After the war closed prices fell off materially, but I continued to ship there until prices got down to about 7 cents live weight, which did not pay; but then, to help cattle-men and feeders out, the English market opened for us, which has continued to increase up to the present time, and which, in the future, no doubt, will be the great cattle market for Canada for all time to come.

FIRST OPENING OF OUR BRITISH TRADE.

I think the first cattle of any account shipped to England was 100 head shipped on the ill-fated steamer *Vicksburg*, which sailed from Quebec for Liverpool on May 27th, 1875, and was lost on June 1st in the ice off the coast of Newfoundland. These cattle were purchased of me by Mr. Jas. McShane, jr., and shipped by him. It is a matter of history that vessel and cargo was a total loss, and of passengers and crew numbering 91 souls, but nine escaped to tell the tale.

LARGE TRADE WITH GREAT BRITAIN.

It is an old adage that “a bad beginning makes a good ending,” and in this instance it has proved true, I fancy, as the trade has grown from a very small beginning till, in five years, it has reached the very magnificent proportions, shown by the following return, which I have been able to obtain from official sources, and believe to be strictly accurate:

[Mr. Wisser.]

CATTLE EXPORT TRADE FROM CANADA TO GREAT BRITAIN.

SHIPMENTS.	CATTLE.	SHEEP.	SWINE.
1877.....	6,940	9,509	430
1878.....	18,655	41,250	2,078
1879.....	25,009	80,332	5,385
1880.....	49,460	81,443	700

In 1880 Montreal, Quebec and Halifax divided the shipments between them in the following proportions :

	CATTLE.	SHEEP.	SWINE.
Montreal.....	35,416	67,943	700
Quebec	9,894	11,208	....
Halifax	4,150	2,292	....
	49,460	81,443	700

Reckoning the cattle, including cost, freight, and all expenses, at \$100 per head, sheep at \$8 per head, and pigs at \$10, we have the following results :

Cattle—49,460 at \$100	\$4,946,000.
Sheep—81,443 at \$8	651,544.
Pigs—700 at \$10	7,000.

Total value of the cattle trade for 1880..... \$5,604,544.

Being an increase of 2,407,138 over last year. I am of opinion that the fact of cattle from Canadian ports, being unscheduled, is worth this year alone \$1,250,000 to the shippers.

This enormous increase of exportation of Canadian cattle, as compared with the previous years, shows that our farmers are more alive to the importance of stock-raising, and of improving the quality, to the standard required for the English markets.

The success which has thus far attended the exportation of Canadian cattle, gives great encouragement to farmers, to pay still more attention to stock raising and improvement of breed.

RESULTS OF THE TRADE.

My experience and judgment as to the value of the different markets are, that the present English market compares with the average of the Boston market, during the time mentioned when we were shipping to the States, although shipping to England is attended with more expense, greater risk, and much more labour than the States trade.

COMPARISON OF DISTILLERY WITH GRAIN FED CATTLE.

As to the relative merits of distillery fed cattle as compared with corn fed stock, I would say, I have sold my distillery cattle, in Boston, against Kentucky and Illinois

[Mr. Wiser.]

blue grass and corn fed cattle, and could invariably sell my cattle for as much as they could their stock. I was never outsold in any market for the same quality of cattle.

EXCELLENCE OF DISTILLERY FED BEEF.

My own opinion is that no beef equals distillery fed cattle. It is juicy and tender, as it can not help being, from the mode of fattening. The cattle are well housed, kept warm, take on flesh rapidly, and are not exposed to cold or storms, which, in my opinion, have a tendency to harden and dry the meat. There is a prejudice, I know, existing with some in this matter, but I do not think it is borne out by the facts. There cannot be any great difference when I tell you I doubt if one buyer in fifty in England can tell the difference between a distillery and a corn fed or farm fed animal.

A GOOD BEAST SALEABLE ANYWHERE.

In conclusion, I would say a good formed, well fattened steer will sell in any market readily, and for full value, without regard to mode of fattening. This, at least, has been my experience for thirty-five years that I have been in the cattle business.

NONE BUT GOOD HEAVY STOCK WANTED.

I cannot impress too strongly upon our Canadian feeders, if they expect to realize the highest market price for their stock, the necessity of sending only good heavy fat stock to market. It is a waste of raw material to send poor, half fattened cattle to England. The market is too far away, and the expenses are too great, to send poor cattle there and expect to get the price good stock will command in their markets.

J. P. WISER.

ONTARIO AGRICULTURAL COMMISSION.

APPENDIX J.

EVIDENCE

RELATING TO

DAIRY FARMING,
CHEESE FACTORIES, CREAMERIES,
AND THE
BUTTER TRADE.



GROUP OF THOROUGHBREDS.

ONTARIO AGRICULTURAL COMMISSION.

APPENDIX J.

EVIDENCE

RELATING TO

DAIRY FARMING, CHEESE FACTORIES, CREAMERIES, AND THE BUTTER TRADE.

Sittings to take oral evidence held at Toronto, June 22nd and 23rd, 1880. *Present*
—Mr. DRYDEN, M.P.P. (Chairman); Hon. S. C. WOOD, and Messrs. A. H. DYMOND, R.
GIBSON, F. MALCOLM, J. P. WISER, M.P.; T. BALLANTYNE, M.P.P.; THOMAS STOCK, W.
WHITELAW, J. P. McMILLAN, A. WILSON, and E. BYRNE.

MR. JOHN INGLIS'S EVIDENCE.

JOHN INGLIS, of Chicago, was called and examined.

THE TEESWATER CREAMERY.

To Mr. Dymond.—I am engaged in the butter buying, selling, and exporting business. I went to Chicago last November; before that I was at Teeswater, in the county of Bruce, for about twenty years. While there I was in the creamery business for a number of years. We started the creamery in 1875. I have paid a good deal of attention recently to the butter producing business in Canada and the United States. In the United States they are changing so much that the old creamery system is getting entirely abolished. There is too much cost attending it. When we started the factory at Teeswater we were induced to start it by a party who had been very successful with a small factory of eighty cows, and who came to Teeswater and advocated the idea of starting one in that section.

COUNTRY BUTTER.

We did not think we could realize the price we afterwards did get for our butter; because twenty-five cents a pound at that time was looked upon as an extreme price. I was then keeping store. I had been in the habit of buying butter largely, but my experience of buying and selling butter before starting the creamery was not satisfactory. When we bought butter it generally came in from the farmers, over salted, and of poor flavour; and when we took it we had to select it according to colour as best we could; and the business was generally attended with loss, especially to the country merchant. Country merchants are in the habit of cultivating a trade with the farmers, and they are willing

[*Mr. Inglis.*]

to pay a premium on their butter for the sake of getting their trade. During the period I was purchasing butter from the farmers its price varied from 12½ to 18 cents.

THE TRADE IN ENGLAND.

I frequently shipped direct to England, and the price obtained there for it ranged from 62 to 80 shillings. When I shipped it on consignment I took what I could get for it. That branch of the trade was not satisfactory; it was most frequently attended with loss. I don't believe in consigning in any way if it can be avoided. I have no reason to suppose that I did not get the market value in England, but when small lots are sent forward they don't receive the same attention as a regular shipment. Canadian butter has a very poor reputation in England; it has just as poor a reputation now as it had then.

STARTING THE CREAMERY.

The production from the creamery at Terraswater was not large the first year. We got the promise of 180 cows, but after we got started they dwindled down to 120, so that we did not pay the expenses in the first year. In the second year we got up to 180 or 200 cows; in the third year we advanced to 280 cows, and after that we got up to over 700 cows. The number always increased up to the time of my leaving, and that creamery is still being carried on. Last season it was very unsuccessful, owing to the low price of butter. We have obtained for our butter from 90 to 120 shillings per 112 pounds, and in the second year after we started the creamery we sold our butter at the creamery for 25 cents a pound, while the other butter was selling at 17 cents.

PRICES OBTAINED.

We had an agent in England. I believe we commanded the full value of the butter there, especially as there was some difficulty in persuading the people that Canada could produce good butter. In 1878 we got 102 shillings, while Danish was selling at 116, and Irish at from 104 to 106. In the second shipment we exceeded the Irish butter by two shillings, and came within four shillings of the Danish. Our agent was at Leith, Scotland, and we were very fortunate in securing him. He came to our factory and examined it—he had seen the Danish and other butters—and he acknowledged then that our butter was equal to anything he had seen in his life. I gave him ten tubs at 25 cents, and the next fall he came back and took it all at 25 cents. He had been buying butter and losing heavily, and he wrote to us saying that ours was the only butter that he did not lose money on. That butter, I think, is superior to the first-class butters in England. The highest wholesale price of first-class butters in England is at present about 130 shillings a hundred weight; I believe the finest English butter is selling at 1s. 6d. wholesale. We cannot take advantage of that, because we have to put more salt in our butter. There is a considerable difference in price between fancy butter and tub butter; the retail price of fancy butter would be, I suppose, as much as 2s. a pound. The English butter is made upon the same principle as our ordinary dairy butter in this country—by farmers in private dairies. But if they adopted the same system in England that we have adopted here, they could make much better butter than we make, as they have finer pastures. There are no butter factories in Ireland that I know of. In Holland butter is made in factories; the cream is gathered on the farm; that, I believe, is the reason of the superiority of that butter on the English market. The Danish butter is made in the same way.

DAIRY, FARM, AND CREAMERY PRICES CONTRASTED.

To Mr. Ballantyne.—The difference in price between factory-made butter and that made in the private dairy is about eight cents a pound; that difference is shown by the returns from what we shipped. Private dairy-made butter, such as I used to buy last year (1879) at ten cents a pound and ship to England, I received from 42s. 6d., to 70s. for, while our creamery butter ranged from 96s. to 100s.; that makes a difference of about eight cents a pound.

[*Mr. Inglis.*]

MANAGEMENT OF THE CREAMERY.

The way we managed our creamery was this:—On receiving the milk which was hauled to the factory, we put it into large vats. We bought the milk at a fixed price. The whole of the milk was hauled to the factory, and we had the skim milk as well as the cream. I don't believe we made one tub inferior to another; what we sent to the Centennial at Philadelphia, and International Dairy Fair held at New York, was just picked out indiscriminately from among the rest. About twenty-seven pounds of milk make a pound of butter; a great many make the average twenty-five pounds. We commenced making about the 10th of May, and ended about the 10th of November. In the fall we could make one pound of butter from twenty-two pounds of milk, but twenty-seven pounds is the average for the season.

SKIMMED MILK CHEESE.

I have tried making skim milk cheese, but I would not approve of that. It was profitable to a certain extent, because we had a local market for our cheese, and did not make sufficient to send to a foreign market; a great many people here are inferior judges of cheese, and if you give them skim milk cheese at two or three cents a pound less than full creams, they will take it; but it would not do to make it an article of merchandise unless the prices of full creams are very high. In the summer season we could get the temperature as low as sixty-four or sixty-five degrees. We had ice but we could not use it to advantage. We had large vats for the milk, and we tried covering the vats with ice under Whitman & Burrell's system, but we found that the cover over the milk was an injury to it.

THE FAIRLAMB SYSTEM.

If I were starting a creamery now, I would not follow the same plan that I followed then. The principle is a false one, and the cost is enormous. I would adopt what is called the Fairlamb process—bring the cream to the factory and leave the milk at home. There is a factory conducted on this plan in Iowa in which a thousand pounds of butter a day are made, with just four men employed in the establishment. Under our system eight men, at least, would be required to do the same work. To make a thousand pounds of butter, 25,000 pounds of milk would be required, and at least twelve teams and twelve waggons would be necessary to draw this milk to the factory. At the factory it would be necessary to have vats that would hold about 600 gallons. You would have to fill these with the milk, let it cool, and allow it to stand for about thirty-six hours. Twelve or sixteen vats would be required, costing \$80 each, as it would be necessary to have vats enough to receive the new milk while what was received before was cooling. Then you would have to skim all this milk, and go through all this extra labour, whereas under the other system you have simply to receive the cream in the factory, you do not need any vats, and as soon as the cream comes in, you turn it into butter. In the Fairlamb system the farmers do not require as large cans as they do for cheese. The Fairlamb can is 17½ inches high, 12 inches in diameter at the top, and 10½ at the bottom, and is provided with a tube in the centre for cooling the milk. The cover is of tin, having a rubber band placed around it, so that when the can is covered it is air-tight. The can is provided with a glass gauge, inserted in its side, for measuring the depth of cream. It holds 7½ gallons of milk. The can stands on three knobs about two inches high, and the tube running up the centre is four inches in diameter, and comes within three inches of the top of the can. In order to cool the milk, the can is placed in a square box filled with water and the water revolves about the can, so that the cooling process goes on constantly. After it stands twelve hours, there is a complete separation of the milk and the cream; the cream is all at the top, and the milk is pure and sweet, and the gauge at the side of the can shows the quantity of cream in it. The cream is then gathered and taken to the factory, where it is paid for at so much per inch, according to the price of butter.

[*Mr. Inglis.*]

ADVANTAGES OF THE FAIRLAMB SYSTEM.

This system does away with the hauling of the milk, while it insures every check on any kind of wrong doing. A great advantage of this system is that there is not so much trouble with it as under the old system with regard to the patrons not keeping their cans clean or caring properly for the milk. Sometimes they are not very careful about their milking, and one can of milk will spoil the whole. Another advantage claimed for this system is that the butter can be made of finer quality. If you work butter too much you injure it, and if you agitate the milk too much, you also injure it; and there is a great deal of milk which is hauled twice a day to the factory, and knocked about so much in the can that the cream will not rise in it so well at the factory as at the dairy. This system allows the milk to be left with the farmer at home, where it can be used to advantage in feeding pigs and calves. As a proof of the rapidity with which this system is being adopted, I may mention one factory which was started on the 1st of June, and has 400 cows already contributing to it, and factories are going up very rapidly in Iowa and Illinois. When I started the factory at Teeswater I don't think there was another in Western Ontario, now there are four within ten or twelve miles of each other. There are factories at Mildmay, Fordwich, Walkerton and Baden. One of the difficulties in the way of starting creameries has been that you could not get enough cream from the small farmers within a short enough distance; but this difficulty is overcome by the Fairlamb system, because you can haul the cream for 20 miles without injuring it, while you cannot haul the milk over six miles.

CREAMERY PROFITS OVER DAIRY EARNINGS.

In the township of Culross I don't think there would be any difficulty in obtaining 2,000 cows; and the difference in the profits between making their own butter and making it by the creamery system would be at least \$15,000. 2,000 cows will produce, we will say, 8,100,000 pounds of milk. Dividing that by 25 we find the number of pounds of butter produced 324,000 pounds, which at 14 cents a pound, would yield \$45,360. Butter made in the factory would easily bring 20 cents a pound, or for the same quantity \$64,800. That would be a difference of \$19,440 in the township, and that is only allowing six cents of a difference in the price, and assuming that the same quantity of milk would be necessary in both cases. 20 cents is a low average of the price of butter made in the factory, and 14 cents is a high average of the price of butter collected from the farmers. Many of the farmers who were slow to go into this factory at first have since said that they made money out of it.

DEFECTS OF THE DAIRY SYSTEM.

There are very few farmers' wives who ever think of using a thermometer with the churn. Sometimes the butter will churn in ten minutes, and sometimes it will take five or six hours. Another reason why dairy butter is poor and of uneven quality is that farmers' wives take the milk and skim it and put the cream in a crock; the next night they do the same, and continue doing so until they have sufficient for a churning. The consequence is that the cream has not the same consistency; some of it is acid and some is sweet; it has not all ripened. It is placed all together in the churn, without any regard to the temperature, and sometimes it comes out white, curdy or stringy, and they are never sure what they are making. Cream requires to be ripened. The uneven quality of our butter arises from ignorance of the process of making butter, and the want of attention to details; and Canadian butter is generally too much salted for the English taste. Butter with half-an-ounce of pure pulverized salt to the pound suits the English market best. That is half the quantity the United States dairymen use. But we beat the American butter in the English market the year before last. At first we salted it with an ounce to the pound, and could not get the price. The next season we salted with half-an-ounce, and it was much finer and brought a better price.

[*M. Inglis.*]

CANADIAN SALT—BUTTER TUBS.

To Mr. McMillan.—I have tried the English and the Canadian salts. I do not find much difference. The butter that took the highest price was made with Canadian salt, and I stopped using the English salt. The brand we used was Ashton's. I think the kind of timber used for tubs makes a considerable difference. I prefer the white ash. White oak is just as good, if you have it. We have used red oak tubs, but they do not keep so clean; they get soiled and stained. Split-stave, smoothed-down, hand-made tubs are the best. But a great many farmers will buy the cheapest, and they will pay 25 cents for sawn stave tubs, when they could get split staves for 40 cents. The Illinois tub, made of white ash, which I am now using, costs 33 cents.

To Mr. Whitelaw.—They use well water to cool the milk. If properly taken care of it will be perfectly sweet at the end of twelve hours, under the Fairlamb system.

To Mr. McMillan.—I cannot say that you can make more butter by the new system than by the old.

TREATMENT OF CREAM.

To Mr. Malcolm.—In the Fairlamb system the cream is dipped out of the cans with a dipper that ends at the bottom like a funnel. It does not hurt cream so much as the milk to draw it a long distance. It is kept as free from agitation as possible, and it is poured into a vessel at the side, so that no dust can reach it; if it is brought into the factory sweet it must stand a while, so that the acid may work upon it until it is fit for churning. The price of cream varies with the price of butter. There is not so much difficulty in getting the farmers to keep the cream properly as is found in getting them to care for the milk. The cream man comes around from the factory every twelve hours for the cream, and the farmer must have his cream ready. I don't think the larger area affects the case. Under the old system a great difficulty was that some farmers were without good water, while others who had high farms were well supplied with good running water, and we had to take milk from both and strike an average. The township where our factory is situated cannot, I suppose, be surpassed for making butter. The Jerseys have been known to average one pound of butter from eighteen to twenty pounds of milk. The average varies, too, in the different factories, which I account for by the want of skill in the butter makers.

SUPERIORITY OF CREAMERY BUTTER.

So that the remedy is in the hands of the factorymenⁿ themselves. As soon as you put your trier into the factory butter you find a richness and sweetness in it that is not to be found in any dairy butter. The dairy butter has not got the flavour of the creamery butter, that is what we call a creamy flavour. The reason of this is that in the creamery we churn every day, whereas, in the dairy at home you may have two or three days' cream together, and the consequence is that the cream has not been ripened equally, and this can be discovered at once by the taste. I have heard that the creamery butter loses its flavour after a certain time, and I know this to be a fact, as all butter will lose its flavour in time. That arises from this circumstance. You may have noticed that when butter is worked an aroma comes from the globules as they are broken, and it only requires a certain length of time until all this aroma or fine flavour escapes, although in the creamery butter the globules are more perfect in form than in the dairy butter. The one has the flavour and loses it; the other does not lose it because it never had it. I have tested the two kinds of butter, and I know that the creamery butter remains sweet for a longer time than the dairy butter.

SIZE OF TUBS.

When making butter I would recommend excluding the air, if possible. I think the 56-lb. tub is the best. If you have a smaller tub you are apt to have a

[*Mr. Inglis.*]

higher tare, which is a considerable item. If you have a 25-lb. tub you will pay 20 cents for it at least, and you will have 6 lbs. of tare; whereas, if you have a 56-lb. tub you will have to pay only 33 cents for it, and the tare will be only 8 lbs., although you have double the quantity of butter. The Dutch butter is generally sent in about 100-lb. firkins. I think the butter would be more exposed in 25-lb. tubs than in 56-lb. tubs. The tubs that come into the Chicago market are all sorts and sizes, from a 5-lb. one up to 70 or 80 lbs.; the consequence is that any tub that runs from 5 lbs. up to 35 or 40 generally sells at $1\frac{1}{2}$ cent a pound less than a tub weighing 50 or 56 lbs.

COLOURING—TEMPERATURE.

I do not recommend colouring butter, unless it is made of hay; I never coloured a pound of butter, and do not believe in it. The cream rises with the change of temperature. If the milk gets chilled, as it is apt to in the fall of the year and winter, the cream will not rise, and it will become bitter. I would recommend heating the milk to about one hundred and twenty degrees. The cream rises because it has a less specific gravity than the milk; and you can make it rise in two ways: you can, by using ice, reduce the temperature to about forty-five degrees, the cold will act more on the milk than on the fatty matters, and the consequence is that the milk goes down and the cream comes up; or you can heat the milk up to one hundred and twenty degrees, and although the heat acts more quickly on the watery portion of the milk than on the fatty portion, as soon as the cooling process commences, the watery part of the milk loses the heat more quickly and falls to the bottom, while the cream rises to the top. I think that is the only remedy to prevent the bitterness of the cream in the winter. The heating of the milk expels the animal odours from it. I would heat it as soon as it comes in.

MANIPULATION OF THE BUTTER.

I would not work butter more than once, and not that if possible. In churning, as soon as the butter granules form, I would advise drawing off a slight portion of the buttermilk from the bottom of the churn, and then adding a few pails of cold water, and after a few more revolutions of the churn the butter will all be formed into complete granules. I would then remove it, wash it, put it on the board, and give it a slight touch, so that if there is any buttermilk on it it will come off. Then mix in half an ounce of salt per pound; lay it aside for twelve hours; then take it and work it and put it into the tub. Over-working the butter injures the grain and makes it greasy, so that the taste is gone. If cream is allowed to stand too long before churning it becomes very thick. There is a certain amount of curd forms in churning, which can be detected in little white specks all through the butter, and there is no means of removing it. These specks are formed by the milk souring and the cream getting too thick. It could be remedied slightly by putting a little milk in the cream and thinning it. I have tried both sweet and sour cream, and I am confident that you can make the sweetest butter from sweet cream. Sweet cream butter, I think, will keep as well with the ordinary quantity of salt as dairy butter. But that is a point very much in dispute. I fail to see why butter which is churned from sweet cream should not keep. To show the advantages of what I call ripening the cream, I have taken cream that was slightly acid, and after churning took one hundred and twenty-three pounds of butter out of the churn; I then told the person who was churning to continue churning, and I took thirteen pounds out an hour afterwards. From the first cream that rises in about twelve hours I would make the best butter, almost gilt-edged. I account for that by the fact that the larger globules rise first, and the greatest aroma is in them.

GILT-EDGED BUTTER.

If I wanted to make a very nice article I would skim in four or five hours; but the kind of butter that I should get in that way should command about a dollar a pound.

[*Mr. Inglis.*]

I have never made butter from the milk of the Jersey cow, but I know that gilt-edged butter is made from the Jersey cows' milk. It is simply a butter of a rich golden colour, with a fine firm grain to it; it has got a rich aroma and a sweet nutty flavour, is without any colouring matter, and is mildly salted; it is, in fact, a faultless butter.

FEEDING DAIRY COWS.

Butter can be produced with a good colour in the winter season if farmers will feed their cattle on hay which has been cut five or six days before being ripe. The natural juices of the hay are better retained in the green state, I suppose, than in the ripened state. I would not recommend feeding turnips or potatoes to milking cows whose milk is used for butter-making. I think milking should be done with the teats dry. Tin pails are much superior to wooden pails for milking.

THE FOREIGN TRADE.

There is a great lack of uniformity in the butter that is now shipped from Canada to the foreign market. I don't think it is possible to work any remedy in it while the present system of private dairying continues. Everybody cannot do his own black-smithing, neither can everybody make their own butter. It is not everybody who has the skill to make good butter; a great deal of cleanliness and common sense is required. It may be very simple, but I don't think you can educate the vast mass of the farmers of this country up to making good butter. The butter buyers are a great deal to blame for the present state of things, because they might do a great deal by buying according to sample; but I would recommend the factory system as a benefit to all concerned—the farmer, the merchant, the buyer, and the country. I have seen bad butter made in the factory as well as in the private dairy, but it was only through want of skill. Bad cheese is made in the cheese factories too, but since cheese has been made in factories it has been of a much higher standard than ever before, and it is certainly a fact that to this hour our ordinary Canadian butter is looked on with contempt, while creamery butter is looked on with favour.

BREEDS OF DAIRY CATTLE.

To Mr. Dymond.—I know nothing about the Holstein cattle as butter-makers, but I believe they are very good. I would not recommend Jerseys for the dairy districts to the exclusion of other cattle. I would just take the common native cows of this country and cross them with thoroughbred bulls; the Jerseys are too small to be of very great advantage to this country; the Ayrshire bull would be good; but I believe the Shorthorn would be the best. By selecting the best females, and killing off the others, I believe we could in a short time obtain a good grade for milking and also work a permanent improvement in all our stock. I believe the milk from a good Shorthorn grade would be satisfactory both in quality and quantity for butter making.

PROPORTION OF MILK TO BUTTER.

With regard to the amount of butter obtained from the milk by private churning, I recollect one instance near the factory: I urged one man to weigh his milk, and he made a pound of butter out of 27 pounds of milk; he was very careful, and had a good milk-house, which nine out of every ten of our farmers lack. I think the average in ordinary private dairying is 40 pounds of milk to a pound of butter; that would be equal to four gallons. I think, taking the season round, a pound of butter can be made by the creamery system from twenty-five to twenty-seven pounds of milk.

GOOD WATER NECESSARY.

I consider the Bruce district—the whole of the Saugeen peninsula—specially adapted for the establishment of creameries. There is a portion of Grey not suit-

[*Mr. Inglis.*]

able at all; the land is too flat and the water too sluggish. In selecting districts for the establishment of creameries, I would be guided to a large extent by the nature of the streams. Water gives both body and flavour to butter, and good butter cannot be obtained if the cows are allowed to drink out of sluggish streams. In order to get good butter, we must have fresh running water for the cattle to drink, and that is the kind of water to be had in Huron and Bruce—remarkably fine water.

To Mr. Whitelaw.—Good well-water is good for butter-making. Still, the cows would not do so well on it as where they have free access to a running creek. They will not produce the same quantity of milk; we find proof of that on farms fed with water from pumps. This has reference to ordinary cows.

To Mr. McMillan.—In the factory system, where you take milk to the factory, you must have a flow of water, but in the Fairlamb system, where you take the cream only, it is not necessary to have the creamery in a locality where there is a flow of water.

To Mr. Malcolm.—I do not think that cattle are injured from the mere fact of being obliged to drink well-water. The only reason is that they have not access to it all the time. So long as the water is sweet, and they have free access to it, I see no objection to the pump.

THE SAUGEEN DISTRICT—MILKING MACHINES.

To Mr. Dymond.—I think the counties in the north-westerly part of the Province are peculiarly adapted to butter making; butter can be made there equal, I believe, to any other part of the world; but to do that, the people require to be very careful about their cattle. I do not approve of milking machines. Professor Lewis, of New York, was shown a new machine for milking, and he said, "I would rather have my cows milked by a calf than have them milked by a machine invented by a calf," and I think that was a good answer.

PASTURES AND MILK—BRAN.

To Mr. Whitelaw.—Long, sweet grasses produce the sweetest milk. The trouble in Canada is that we have not variety enough, and in seeding down, the farmers mostly seed down their land with grain. If farmers would seed down with grass alone, and sow three or four times the quantity and variety they do, they would have good pastures. A good patch of timothy and clover makes a good pasture, but it does not last during the season, and clover will never make first-class butter.

To Mr. Malcolm.—I do not think bran is profitable feed for the production of butter. I think the finest feed to give to a cow is a little oatmeal. Sweden, which takes the lead in butter, feeds almost entirely on oatmeal. The shells of the oats should be retained in it; it is just the oats ground up.

TEMPERATURE FOR CHURNING.

To Mr. Dymond.—In churning butter we vary the heat somewhat, according to the temperature of the atmosphere around us. A great many take 60 degrees, but I find that it requires from 58 to 65 degrees, according to the temperature of the weather. Still, from 60 to 65 degrees is the best average.

RAPE—TURNIPS—SALTPETRE.

To Mr. Malcolm.—Turnips and other roots of that kind give the butter a rank taste. I never saw rape used for feeding cows. A great many advocate feeding turnips to cows after milking them, but I think they always leave a taint. You can smell it in the milk.

To Mr. McMillan.—I believe saltpetre is used, but I think it is an objectionable thing to have in butter or in anything else.

[*Mr. Inglis.*]

BUTTER IN THE STATES.

To Mr. Dymond.—In the United States I buy butter made principally on farms. I find the same difficulty there as here, and perhaps a little more, with regard to that class of butter. American creamery has a better reputation in England than Canadian butter, owing to the American brands having been longer established. We have no particular brand shipped from Canada except what is labelled "creamery." It is advisable in every instance to put "Canada" in large letters on every tub. I think "Ont.," which is usually put upon the tubs, is not understood by the English buyers.

SALT—PACKING.

To Mr. McMillan.—The Americans use one ounce of Higgins' salt to one pound of butter, but it is too much, as mild-salted butter will bring 5 to 10 shillings more per 112 lbs, in the English market. I use the Canadian salt, which I am confident is equal to any English salt in the manufacture of butter.

To Mr. Wilson.—In placing butter in a package for shipment, I would put in the butter within half an inch of the top, and would fill up the remaining space with salt, wetting it sufficiently to make it pasty. That makes a solid, firm keg, and excludes the air, and the salt that is in the butter makes its own brine. I do not think it advisable to put brine in the keg.

SKIMMING—BAD CHURNING.

To Mr. McMillan.—The real standard test for the proper time of skimming milk is to take the finger and bring it across the cream. If, in doing so, the cream lies apart and you can see the milk, it is time to skim. The churn is of great importance, and there is a great deal of milk spoiled in the churning. The great bulk of the butter made in this country is whipped to death in the churn. For farmers the dash churn is the best. The dash should be concave in the bottom, so that it makes a vacuum when the dash comes down, thus striking the milk more by concussion. There should be no holes in the dash, as they tear through the milk and break the grain. The barrel churn with a stationary dash is the best for general purposes. The Blanchard is also a very good churn. Patent churns which work by friction bring the butter rapidly, but it spoils the quality by whipping the cream. I have not seen the pendulum churn. The whole difference between a good and a bad churn is in getting the milk by concussion instead of friction. A churn suspended by the two opposite corners ought to be a good one.

CARE IN PACKING NEEDED.

Butter can be packed so as to retain the flavour, though it is reported that creamery butter loses its flavour. The flavour arises from the breaking of the globules, and in order to retain it you want to get the butter to market without interfering with these globules. As soon as the butter forms in granules, have it washed clean, put it in a large firkin, but do not work it, exclude the air from it as much as possible, and send it off. When it goes to the market, and the package is opened and the butter is worked, the flavour arises. I do not think, however, that that system will come into general use. I have kept butter in a glass jar for eighteen months, and on opening it, it was all right in flavour. If the butter was soldered into tin packages it would come out all right. (Witness examines a tin butter package shewn by the Commission, and continues:) If a package like this could be made for 50 cents I think it would be a good one.

To Mr. Dymond.—If butter could be packed in neat packages, and marked as a special Canadian brand of first-class butter, and put up with an attractive appearance, I think it would be a great advantage, for there is a great deal in having it neatly packed.

[*Mr. Inglis.*]

To Mr. McMillan.—The best butter which is made in Sweden, and exported to the West Indies, sells for 50 cents, and it is put in tin packages. In the United States they generally sack the butter tubs before shipping; it not only keeps the butter cool, but when it arrives the packages are clean and more attractive.

IMPROVEMENTS IN PASTURES REQUIRED.

I should like further to remark that it is the food which sustains the cow that also produces the milk, and the milk to a great extent retains the odours of the food. Hence the necessity of studying the pastures. The farmers should study more fully the subject of pasturage, also the nature of grasses; and seed down more heavily with all the long grasses that will grow, as some mature faster than others, and as one fades away another will take its place. Hay is generally cut too ripe, as after it is dried it becomes woody, and there is very little nutriment left in it. If cut green and well saved the difference of its milk-giving properties is enormous. Butter made from ripe hay is always white, and lacks the rich aroma that makes it a luxury.

CLEANLINESS OF UTENSILS.

After we have the milk all that is necessary to make good butter is common sense and cleanliness. Every utensil used must be scrupulously scrubbed and scalded. Cold water is of no use. The slightest carelessness in this respect will cause the milk to sour. By all means avoid wooden pails. A very reprehensible practice of taking cream and placing it in a wooden churn until sufficient is gathered to make a churning is very common in the country. It is impossible to make sweet butter by such a process. A wooden vessel can not keep cream sweet for 24 hours.

CARE IN DRIVING COWS.

Farmers should be very careful about driving their cows home from the pasture fields, as great injury arises from overheating the animals. To show more fully the evil effects of rapid driving I may cite an instance that occurred under our own observation. We had a vat of milk containing 600 gallons which was continually getting sour long before the others. We were considerably troubled about the cause of it. We commenced to examine carefully each can of milk put in that vat. Our suspicion at last settled upon one particular can. We placed it to one side, and found it get quite sour in a short time. On going out to the party who sent it we found that his boys were in the habit of dogging the cows home at a brisk pace every night and morning. We finally had to stop taking his milk, as he seemed powerless to prevent the continual repetition of the mischief.

JOHN INGLIS

MR. D. M. MACPHERSON'S EVIDENCE.

MR. D. M. MACPHERSON, of Lancaster, was then called and examined.

THIRTEEN CHEESE FACTORIES.

To the Chairman.—I have had about eleven years' experience in cheese-making. I have had some experience in the production of milk, but latterly it has been in the management of cheese factories. I have been conducting cheese factories about ten years, and I am running thirteen factories at the present time. Dairying is greatly increasing in our section of the country. It was very limited at first. The cows on each farm were few in number, but the number is increasing now, and farmers are going largely into the produc-

[Mr. Macpherson.]

tion of cheese. My knowledge of dairying is confined to cheese-making. The factories are conducted on the principle of private enterprise, though there have been some Joint Stock Companies, but they have not proved an entire success. The great difficulty with them was the selling of the cheese, and also about getting some skilled person to manage and conduct the factories properly. Three of the factories are owned by Joint Stock Companies and are rented. They were run for several years, and they then turned them in to my hands to manage. The total cost, including drawing, per hundred pounds would be from $1\frac{1}{2}$ cents upwards.

ORGANIZING A FACTORY—NECESSARY CONDITIONS.

The first steps taken in organizing a factory are of great importance, especially the educating patrons to see the necessity of delivering their milk in proper condition; keeping the cans clean, and giving it the greatest attention possible. The milk is delivered in the morning of each day. Great attention is paid to having the milk aerated before being sent to the factories. That is a point which I impress very strongly on my patrons. It should be aerated while the milk is fresh and warm, as this drives off the injurious gases more easily. When it is properly aired it should be cooled down to about 65 degrees to preserve it from souring. That has the effect of preserving it pure in flavour, and the chilling keeps it pure with regard to sweetness, and these are two very desirable qualities in good milk. I like to get it into the factory as early as possible in the morning, before half-past seven or eight o'clock. There was at first a great deal of objection by patrons and cheese-makers to the once-a-day delivery of milk, but I persisted in the plan, and it has proved an entire success, and from my experience I would not recommend its delivery twice a day. The advantages of the system are, that it saves labour, and the milk can be better preserved as to flavour and quality by the patrons than at the factory. As to factory milk cans, we have all sizes from 15 gallons up to 30 and 35. Great stress is laid on the thorough washing and scalding of the cans, and they should also be aired before the milk is put into them. The greatest pains should be enjoined upon patrons to have the cans properly cleansed, as this is an all-important point

DELIVERY BY PATRONS BEST—THE CANS.

Milk is carried in many cases by the patrons themselves. In some cases waggons are put upon the road in different sections to gather the milk. I have found, however, in my experience, that where the patrons deliver their own milk more general satisfaction is given. They can milk with more leisure at their homes, and study their own convenience also in its delivery up to the last hour for receiving it. Another advantage is that the can can be left at a convenient place at the house upon its return. When waggons are employed it is impossible to leave the cans close to the house, and this is considered a great objection, but in cases where patrons are a long distance off and could not conveniently haul their own milk, waggons are employed. Cans are left on platforms at the roadside. If the milk is properly ventilated, where it should be at each farmer's house, the ventilation of the cans is not of much importance. I have had large experience in ventilating cans, and I tried several ventilators, but they did not prove successful. Many of them secrete formations in the seams and corners, and work more injury in this way than the benefit derived by aeration. Most of the milk cans coming into my factories have small conical spouts in the centre, which is the only thing used in ventilation.

MODE OF TESTING THE MILK.

The mode of testing milk at the factory is a very important point, and it is a difficult and intricate matter to conduct the test in the factory. I have given a great deal of attention to devising a mode of detecting adulteration or a reduction of the quality of the milk coming from each dairy. I use the lactometer in combination with the cream gauge. I devised a simple water-tight box, lined with zinc or tin, with a tight-fitting cover; an inner piece of thin perfor-

[*Mr. Macpherson.*]

ated board is placed five inches from the bottom and eight inches shorter than the box; this space is for broken ice (fine) to remain. Each patron has a mark, and as the milk is received at the factory a sample is taken and its temperature and specific gravity recorded by the lactometer, and then the cream gauge is filled five inches deep and immersed in this box, containing ice and water to the same height of the milk in the glass, until the result of each patron's test is recorded in a book. If the milk is all sweet the amount of cream can be measured in about five hours or more. Six-eighths to seven-eighths of an inch of cream on five inches of milk is considered good milk. The standard of each dairy can be obtained in this way and should be a guide for future reference; the same dairies should not vary much from time to time when tested. However, I prefer for the cream to remain for twelve hours, when it will shew a decreased percentage of cream. The reason is that the cream rises very rapidly in the ice-water; by giving it time it becomes more compact, and gives a lower degree at twelve hours than at six. The depth of the milk in these testers is five inches, and the percentage of cream is easily calculated in that way. If there is half an inch on five, it is ten per cent.; three-quarters on five would be fifteen per cent., and then a record is kept of all the percentages of cream on each sample, as we find this to be the most reliable way. The lactometer is the only instrument which satisfactorily detects the addition of water to milk, and it is not accurate enough to detect a reduction of the quality of the milk by skimming, keeping back the strippings, etc

RENNET—HANSON'S EXTRACT

The rennet plays a very important part in the manufacture of cheese, especially with regard to its purity and strength. For the last two years I have used Hanson's extract, which has given entire satisfaction. Its purity is perfect and its strength is reliable. This preparation is perfectly transparent, whereas in the old preparation there were particles of fleshy membrane flowing through the mass, which it was impossible to strain or take away by settling; in our section of the country it is becoming universally used. It has another good quality, it can be measured out in a certain quantity to a given quantity of milk, whereas, in the old form there was no rule to go by except to judge of its strength by previous workings with each batch of rennet. I think I have carried out the experiment of trying the common rennet and Hanson's upon the same milk, and from the comparative workings of the two, taking them on the whole, I think the extract gives the best satisfaction. Rennet varies very much in strength, whereas Hanson's extract is uniform, but if applied in smaller quantities it works slower, but it will not shew the same action on the curd as the common rennet. The very steeping of common rennet is an experiment. I am satisfied that there is nothing by which more injury can be done to cheese than by using bad rennet. A great many get bad rennets, and others do not know how to prepare them.

HEATING AND CURING.

With regard to the heating and curing room, a very common way is to heat with a coal stove. The great requirement is to keep a uniform heat of about 70°. The evenner the temperature is kept there, the more thorough the curing and the more perfect will the cheese be in quality and flavour. The curing room should be perfectly protected from sudden changes outside. Hot water is very good, but it is a little more expensive, though it can be used from the boiler that is used for heating the milk. Steam is now universally used for the heating of vats, as it is the most convenient and suitable. Steam is applied to the water, and the water to the milk vat. The space between the milk vat and the wood is filled with water, and the water is heated, so that the heat is carried evenly and uniformly. By using dried steam in heating the milk in the vat the changes are too sudden and the temperature gets too high in places. The hot steam striking it at from 212 to 250 degrees requires too rough handling in the agitation of the curds to keep the heat uniform. Sudden changes are avoided in the way I have mentioned.

[*Mr. Macpherson.*]

CURD CUTTERS.

I have given a great deal of attention to curd cutters, and have endeavoured to get a curd grinder and cutter that will do its work properly and thoroughly. I prefer curd cutters to the mills, as the latter have a tendency to bruise and destroy the fine texture of the curd. Cutting, if properly done, aerates a larger amount of surface, by making new surfaces, and puts it in good shape to allow the salt to permeate. I devised one which acts on the principle of cutting the curd in slices from one-eighth to one-sixteenth of an inch in thickness. This plan gives more surface and the aeration is therefore more complete; while if the divisions are large the salt is not allowed to pass through them. By cutting the curd in flat surfaces, any gases that may have developed in the manipulation are allowed to pass off. I am therefore much in favour of curd cutters as giving a silkier texture and a closer, finer quality to the cheese than any other way. All the mills that I have examined, whether single or double cylinder, have a tendency to bruise and destroy the texture of the cheese.

MANAGEMENT OF THE CURD—STIRRING AND AERATING.

After the curd is formed, and the rennet is applied, we generally want to have it firm enough to keep in from forty to fifty minutes after the application of the rennet, and the cutting process is done all at once by the curd knives. It is allowed to stand after the cutting from ten to fifteen minutes in order to form the whey, so that the curds may pass each without pressing in the agitation of the heating. It is very gently agitated, and the greater gentleness and care that is exercised at first, when it is in the soft state, the better. This agitation is kept up continuously until the heat of the curd has reached from 96 to 100 degrees. This process should take from thirty to sixty minutes, according to the condition of the milk. If the milk has a tendency to be old it should be rather hurried, and if it is in good condition an hour should be taken. When it has arrived at 96 or 100 degrees the whey is drawn off, till the curd appears on the surface, and it is allowed to stand until the first signs of lactic acid are detected. At that stage the whey is drawn off, and the curd gently stirred and aerated from fifteen to twenty minutes, and sometimes longer. The curd is worked down to a sufficient firmness, and it is very important to retain just sufficient moisture, not too much or too little. It is at this stage that the moisture is to be gauged from the time of the drawing of the whey until the acid is developed one-half. The agitation should be started so as to express all the moisture, but if it is on the soft side there will be more agitation required until it is worked down to sufficient firmness, which can only be detected by experience. It is then allowed to rest. In stirring the curd and airing it, the particles have an opportunity of being oxydized. If the curd be allowed to mat together, after the development of the acid or the maturing of the curd, all become uniform. Sometimes the moisture running from the curd is at this stage bitter and perceptibly acid. It is then cut with a knife into pieces and drawn in a heap to the sides of the vat. It is then cut with a knife in blocks of from six to eight inches square, and if sufficiently matured it is ground. You will see at this stage the advantage of the curd cutter, because when the curd is run together in one mass the cutter forms new surfaces; whereas the peg-mill only tears apart the old surfaces, the object still being, of course, to aerate as much of the curd as possible.

SALTING—PRESSING—OILING.

After the curd is ground it is stirred in the air gently before salting. It is then salted and heaped up for ten or fifteen minutes. The salt is thoroughly stirred in, from three to five parts each time, and stirred so as to thoroughly incorporate it into the mass. From two pounds to two and a half of salt is used to a hundred pounds of curd. After all the salt is on and well stirred in, the curd is heaped up all into a mass so that the salt may permeate. It is then put into the press. The pressing is gentle at first, but should be increased every

[*Mr. Macpherson.*]

ten minutes continuously for two hours. The cheese is taken out and turned over in the press and a heavier pressure applied afterwards. Some cheesemakers turn it again in the morning, which I believe to be a great improvement, as it would make a finer and closer texture and give it a better appearance on the shelves. The time of pressure is from twelve to twenty-two hours, giving it sufficient time to remove before the next day's cheese is pressed. It is then carried to the curing room, carefully bandaged and oiled, or greased, with a brush. I find that oil applied nearly at boiling point with a brush requires less work and gives a better surface than if applied in the common way. It gives a tougher rind and a nicer appearance. Early cheese is made much in the same way, the only difference being the application of more rennet and less salt and a higher degree of curing. All the other steps are similar. The making of grass cheese depends a great deal on the quality of the rennet, and with that exception my remarks apply to it as well as to other cheese.

BOXING THE CHEESE.

With regard to boxing, I found, when I was in Montreal and other places, that a great objection was taken to cheese being shipped in improperly fitted boxes. The boxes should fit closely and should be cut down even with the cheese, so that the cover will always touch the cheese. The proper place to have the coopering and cutting done is in the factory. Some object to using a nail, but it is a matter of choice. I have in all cases nailed my boxes in the factory, and ship direct, so that there is no coopering afterwards. It is a great deal of trouble to the shipper to go over them and fit them. The boxes should be double banded and made of straight grained wood. The covers should be made to fit tightly on the boxes.

MODE OF COOLING MILK.

To Mr. Wilson.—As to the method which I would recommend to patrons of cooling their milk to keep it over night, I would approve of using a plain long-handled dipper to aerate the milk, and setting the can in a vessel containing double the amount of cold water that there is milk in the can. Some of my patrons use a square box or a round tub, but it is a safe gauge to go by to have the vessel contain double the amount of cold water that there is milk in the can, and the water should be fresh from the well or spring. In that way you will reduce the milk from 90 or 95 degrees to 60 or 70, which is a sufficiently low temperature for good satisfaction at the factory. Allowing patrons to carry the whey home in their cans when returning from the factory is an objection which it is difficult to get over, though if care is exercised it is not a very grave one. The objection which all factories meet with is the lack of cleaning the cans.

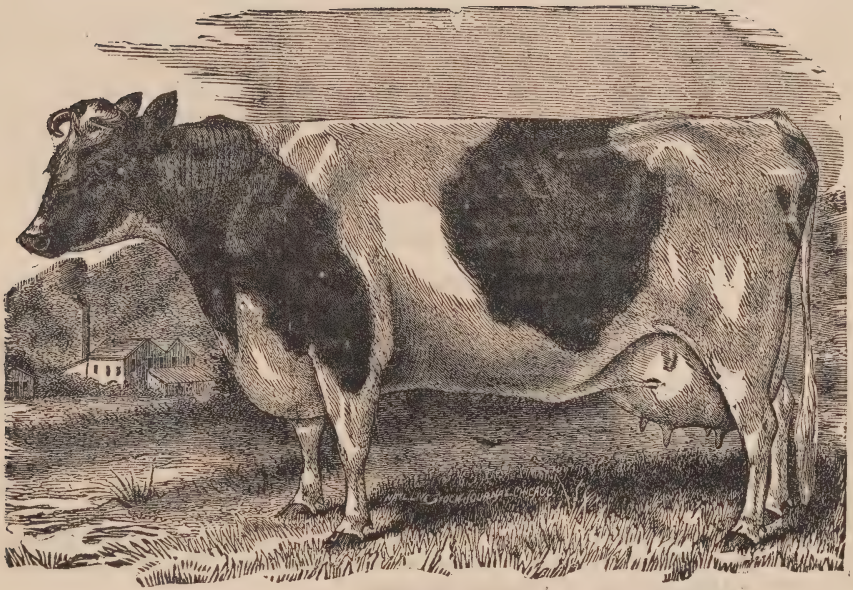
RETURNING THE WHEY.

To Mr. Ballantyne.—The patrons of all my factories carry back the whey in their cans. I have some difficulty from it sometimes, but I make it a rule not to receive any milk which would be an injury to the product, and, where milk is only drawn once a day, cases of negligence are more easily detected. Where it is practicable, I should say it is safer that the whey should not be carried back. I believe that very often carelessness in handling gives a sour, buttermilk flavour to the cheese. My taking milk only once a day assists me greatly in detecting negligence on the part of any of my patrons. I consider it decidedly better to have the milk hauled to the factory once a day than twice a day. One great reason is that the milk can be better cared for and aerated at the dairy than at the factory.

AERATING THE MILK BEFORE DELIVERING.

Milk, when drawn twice a day, is spoiled before it reaches the factory, because it is put in close cans before it is aerated sufficiently at home. With all the cheese

[*Mr. Macpherson.*]



HOLSTEIN COW.

we have made for the last ten years, we have in no case had a floating curd, and I believe this is traceable to the fact that we had milk hauled only once a day. In once-a-day hauling all the injurious gases have time to pass off from the milk before it comes under the control of the cheese-maker. We have to use a great deal of judgment in the application of salt. The more moisture there is in the curd, the more salt it requires. In the spring, for example, when the weather is cold, there is more moisture retained in the curd than in the summer, and consequently it requires more salt in the spring and fall to make up for the superabundance of moisture and to retain the same amount of salt in the curd as in the summer.

TEMPERATURE—SALTING—MOISTURE.

We keep the temperature as near as possible from 95 to 98 degrees. Early made cheese should not contain proportionately so much salt in the curd as summer made cheese, although it may be necessary to have more salt applied. Even temperature is the chief thing to be sought after in cheese-making. A coal stove will produce the most even heat, and will not require any attention during the night. I am now making from four to five tons of cheese a day. I may say that the grade of cheese has varied. At first I was making cheese with about 35 per cent. of moisture, and the requirement of the market has caused us to reduce down to about 30. We were making a pound of cheese from about nine and a half pounds of milk in the first five or six years that I was in the business, but now it takes ten pounds or more. The yield of cheese from a given quantity of milk depends greatly upon the percentage of moisture retained in the curd. It has been found by analysis that the finest cheese in the market contains from 30 to 32 per cent. of moisture, and in order to obtain the highest value I aimed to raise the cheese to that point.

QUALITY THE FIRST OBJECT—UNIFORMITY OF STANDARD.

Quality should be the leading consideration in making cheese, and then quantity, by which I mean the quantity of cheese produced from a given quantity of milk. One of my greatest difficulties has been to get the cheese of the different factories at a uniform quality; in that effort I think I have succeeded more this year than ever before. In order to attain that object generally throughout the country, I think it is better that one practical person should have the management of a section of factories than that each factory should be managed separately. I think that system of management would be as great an improvement on the present factory system as the factory is on the private dairy. It would raise the standard of cheese everywhere. The great complaint at present is that there is a want of uniformity, as well as a great deal of inferior cheese. Farmers are beginning to take more interest in the proper care and housing of their stock, and dairying is more generally gone into than formerly. Last year was not at all satisfactory in regard to prices, but the patrons all appeared to take in the situation and not to be discouraged by one year's bad prices. The coarser I get my salt the better I like it; I use the Washington to a large extent; the Higgins is very good, but it is a little too fine. I have found that from two to two and one-third pounds of coarse salt will retain as much saline matter in the cheese as three pounds of fine salt. I am speaking of English factory-filled salt. I have not tried the Canadian salt to any extent.

MODE OF COOLING AND AERATING MILK.

To Mr. Byrne.—Milk, before being cooled, should be aired for from fifteen to twenty minutes, with a dipper, immediately after it is milked. It is very important that it should be aired while it is warm. It is much better to cool the milk at home, also, than at the factories. Being distributed in smaller quantities, it can be cooled much quicker; it can be aired immediately after it is milked, which is the proper time, because the injurious gases then pass off in vapour, whereas, if the milk was drawn to a factory before it was aired or cooled, these gases would be retained in the making. You get a finer flavour and a finer quality of cheese if the milk is cooled at home, everything else being equal

[*Mr. Macpherson.*]

STANDARD OF CREAM—PROPORTION OF CHEESE TO MILK.

From 14 to 16 per cent. is the standard of cream in good average milk. We cannot judge each man's milk from one common standard; but we get a standard of the quality of each man's milk, and judge what we shall get from him in the future. Some herds give richer milk than others, and we have to take a medium average of all. In estimating specific gravity we allow from 95 to 100 for good milk. Fresh morning milk will not show as high a specific gravity as the night's milk. If the milk was diluted I would make a variation of from 5 to 6 per cent. The average amount is about ten pounds of milk to a pound of cheese, and the average is becoming more and more every year. We took more last year than ever before, because we had to make a dryer and firmer cheese. It is not possible to make a fine cheese for export on a less average under existing demands of the market. The latter part of the season has quite an advantage over the fore part in reference to the yield—the milk is much thicker, and there is a larger proportion of the solid parts of the milk in the fall than in the summer—from 5 to 15 per cent. more. The month of June will give a better yield than May, and July and August generally fall behind June. I cannot account for this. I know that in June we always get a slightly better average than in July, and in the latter part of August, September and October there is a improvement right along.

To Mr. McMillan.—There is a simpler plan of aerating milk as it is being milked from the cow, and that is to have a vessel with small perforations above the can and straining into it the milk of each cow. In this way it is very thoroughly aerated under the best circumstances—that is, while it is fresh and warm. The cans should be set in a tub of cool water.

FACTORY ARRANGEMENTS.

To Mr. Dymond.—I am paid so much per hundred pounds. I get one and one-half cents per pound, which covers all the work of manufacturing, selling, boxing, keeping the books and paying the dividends. The drawing is not included. The one and one-half cents pays for all the work, from the time the milk comes into my hands until the return is made. The patrons give me the full charge of selling and making all the cheese. I think that is a better plan, when it is studied closely, than the self-managing plan. The market requires certain standards of cheese which we must endeavour to work to. If there were several co-operative institutions in a district without being under the management of one individual, they would not try to attain to one standard. My factories cover an area of eighteen miles square. They are co-operative institutions, inasmuch as there is a general interest in the returns. Since I have had these factories, the patrons have shewn the highest desire to meet my views in regard to keeping the milk in proper condition. Attempts at fraud are not at all frequent. The knowledge that there is a test, is a restraint on dishonesty in addition to the natural honesty of the people. The hand or arm is very little used in my system of making. It is used in one or two stages such, for instance, as stirring in the salt. It is necessary in that case, because you have more control over the curd so as to stir it thoroughly. I suppose there are 4,000 or more cows supplying the milk used in my factories. I have not tried Canadian salt to any extent. English salt is considerably cheaper than the Canadian salt in our neighbourhood, and, as a matter of fact, it is most approved. I do not think there has been any thorough test between it and the Canadian salt. There might be an idea that the English salt is better because it has a better reputation.

DRAWING THE MILK—THE LACTOMETER.

To the Chairman.—I am very decidedly in favour of drawing milk once a day. In some of my factories the patrons do all the drawing of their own milk. Occasionally I assist in getting the route started, but I am not supposed to do anything in connection with the drawing. I have some patrons who have been drawing their own milk a number

[*Mr. Macpherson.*]

of years for some four miles, and though there is a waggon passing their door, drawing it for five or six cents per hundred, they prefer drawing their own milk. One of the patrons I refer to supplies 300 pounds of milk a day which would be fifteen cents, but he prefers drawing it himself. The reason he does so is that he can leave it at his convenience, and when he returns he can leave his can just where it suits him; besides, he keeps his can better from wear and tear in waggons. Cans, if carelessly handled, are apt to be abused. With the lactometer the lowest percentage of water that can be detected is very small. We are pretty certain of anything over five per cent. If it is about five per cent. it is sometimes necessary to see the cows milked, test the milk, and compare the result with that of the milk at the factory. Very often it is detected by watching them and detecting them in the act. If the lactometer shewed a very slight variation I would suspect there was something wrong, and I would watch very closely. Two per cent. is too small a variation to notice, because it is rather fine work on the lactometer. Milk will vary itself to that extent from day to day. Six or seven pounds on every three hundred might be a large fraud in a season, though it might be difficult to detect it. The process of manufacture which I have described differs slightly in different parts of the season. The addition of sour whey in the process of manufacture I find a great injury to the product, and it should not be allowed under any circumstances.

CHEDDAR CHEESE.

The cheese which we make by the process I have described is called Cheddar. I have only seen English Cheddar cheese once, that was in New York last year. I did not consider it anything like as good as our own Canadian exhibit. I think the great bulk of our cheese will compare favourably with the best Cheddar. The standard which I try to make has a close texture, feels silky, and smooth by pressing between the thumb and finger, and shows good meat. Purity of flavour is of course the great desideratum. I think it is best to aerate the milk before cooling it.

ANIMAL ODOUR.

It does the milk an injury to cool it immediately, but by following the directions I have given we get rid of its animal odour. This odour is very volatile, and when the milk is warm it rises in vapour, but if you cool the same milk without aerating it the odour can be perceived whenever it is warmed up again. I have no trouble in my new factories in getting the patrons to take proper care of the milk, because they can be started on a right basis. One factory that I have rented was badly managed before, and the patrons got into a loose habit of caring for their milk and I find a great deal more trouble with them than with any of the others. If an injurious flavour is left in the milk it is a fixture and you cannot eradicate it.

ADVANTAGE OF HAVING ONE PRACTICAL OVERSEER.

I think there is a great advantage in having one practical man to oversee a number of factories. I believe that it would pay any township or any number of factories joined together to employ a first-class, experienced hand merely to superintend them, going from factory to factory and seeing that they were all working to a high standard. If there were twelve or fifteen factories, the increased quality and quantity of the cheese would well pay the wages of such a man.

JOINT STOCK COMPANIES.

To Mr. Ballantyne.—There is only one joint stock company in our neighbourhood I think it has paid a dividend. In the factories under my control, 60c. or 70c. per hundred pounds of milk was the price realized. A paying price for the cheese to the patrons is 80c. or \$1 per hundred pounds of milk, exclusive of commission.

[*Mr. Macpherson.*]

AVERAGE OF CHEESE PER COW—FEEDING—BREEDS.

About 450 or 500 pounds of cheese is the highest average per cow in any one herd. They were a select native stock with perhaps a sprinkling of Ayrshires and Durhams. Three hundred is a very good average, but these cattle were very well cared for and well selected. They were fed on green hay and had no grain at all or roots. By green hay I mean early cut hay well cured, a mixture of timothy and clover, cut from the 4th to the 10th of July. The clover was in full blossom. I have no doubt that hay properly cured and cut at that season of the year will give as much milk as ordinary hay with a free addition of grain. There are few in our district who have improved their stock by selecting cows and bulls.

HEIFER CALVES—PROLAPSUS—MILK FEVER.

The Durham bull, however, is coming into more general use. There have been Ayrshires for a few years back, but latterly the favourite breed is the Durham. It is now quite common for our farmers to raise their best heifer calves to supply the waste of their herds. They like them to come in April. They are generally brought in when two years old. I prefer that age, as it seems best calculated to develop the milk-giving properties of the cow. There is no difficulty in getting cows that are well kept in calf, and there are no losses by abortion except by accident. There have been some cases of *prolapsus uteri*, resulting fatally in some instances. Milk fever has been prevalent to a small extent.

IMPROVEMENTS IN TREATMENT OF STOCK.

Great improvements have been made in stables the last few years since factories were introduced, farmers having devoted more attention to housing their cows, keeping them comfortable and feeding them well. There are different kinds of stables, but the cows are generally tied with chains, very often facing each other with an alley between them. Stables are generally frame, closed in and made comfortable and warm, and well ventilated. There is not much bran or chopped feed used now, though considerable is used when the cows come in. Farmers are cutting their hay earlier than they used to, and when they do so their cows do not require so much grain. There is not much summer feeding. I consider corn excellent green feed for cows during the last of July or in August. I do not know that it increases the flow of milk, but it keeps up a uniform flow and also keeps the animal in good condition. There is not much permanent pasturing laid down in the section. It is generally broken up after about three years pasturing. Grass is the natural food for the production of milk. I have had some experience in bran feeding, and I find that it has not nourishment enough. It excites too much milk at the expense of the cows' vitality. A mixture of oatmeal and barleymeal with bran is good.

POINTS OF A GOOD DAIRY COW.

A good dairy cow should have a pointed head and neck, loose skin, wedge-shaped body, rather preponderating in weight towards the hind quarters, having rather a heavier appearance from a side view than in front, a slim tail, a large udder and a docile eye.

FARMING IN GLENGARRY.

To Mr. Dymond.—The cattle in our neighbourhood have been generally free from epidemics and diseases of that kind. There has been no attempt to make a cheese like the English Stilton. It requires the addition of cream, which is impossible under the factory system. I have known some to make it in exceptional cases. I have been living my whole life in the district where I now reside. There has not been much new migration coming in the last few years. When I speak of my district I mean the

[Mr. Macpherson.]

county of Glengarry. There are a great many young men leaving the country. There seem to be more of them than are required at home, and they go away to seek their fortune. It has been noticed that there have been more this year than for a number of years back. Of course many who leave come back again imperceptibly. Some go to the United States and some to Manitoba. Farms can be purchased in Glengarry at a reasonable rate, from \$30 to \$40 per acre for farms in fair condition, fairly good soil and buildings. I cannot endorse the opinion that there is no good soil in Glengarry. The soil varies very much, some parts having very ordinary soil, while in others it is of excellent quality. In some parts of Glengarry there is about as good land as can be found in any other part of the Province. They grow corn, barley, peas, etc., as wheat is not a success, though there are exceptional years when it turns out fairly. The growth of fruit is increasing, chiefly apples. Strawberries are not grown to any extent. The country is being denuded of its timber, but there is quite sufficient for family purposes. Now and then you will find a farm which has not sufficient for home use. During the last few years there has been a decided improvement in the condition of agriculture. There has been more interest taken and a better quality of farming and outbuildings, a result which I think is largely due to the introduction of dairying. Meat is not much raised for export nor is butter. Three butter factories were started at one time, but they have been converted into cheese factories. A number of the farms of the county are encumbered by mortgage and otherwise.

D. M. MACPHERSON

EVIDENCE OF MR. BRODER, M.P.P.

ANDREW BRODER, M.P.P., of West Winchester, Dundas County, was called and examined.

THE EXPORT BUTTER TRADE.

To Mr. Dymond.—I have been engaged in the butter trade for some time. I buy largely and ship to England. I buy in different sections of the Province, wherever I can get a supply. I have agents and correspondents in different parts of the Province. Toronto is about as far west as I go. I have been engaged in that trade for ten or fifteen years. I have had nothing to do with the manufacture of butter.

DAIRYING IN THE RIVER COUNTIES.

The part of the country in which I reside is very well adapted to butter making, as are also the whole of the counties of Grenville and Leeds. The limestone formation is suitable for the growth of the grasses that make good butter. There is a great deal of land in Leeds and Grenville suitable for dairying. Dairying is largely carried on in Dundas, principally by farmers themselves.

CREAMERIES IN THE DISTRICT.

There are a few creameries in the counties I have named. There is one near Morrisburg, formerly known as the Farlinger Creamery, and in Leeds there is one in Leslie town. There are none in Grenville that I am aware of. There may have been some established this spring that I know nothing of.

QUALITY OF THE DAIRY BUTTER.

The butter produced in that region is, as a whole, a fairly marketable article. I have regular agents for the sale of butter in England. I have no difficulty in commanding a good price there, under ordinary circumstances.

[*Mr. Broder*]

CARE IN GRADING AND BRANDING BUTTER.

Butter quality

I am very particular about grading and branding it just at what it is, and I find it very necessary to do so. From our own section we have two brands, and from this (Toronto) section, I have sometimes found it necessary to make four. Butter in our section will grade fairly into two grades, but not in other sections where it varies more. Montreal is the port of shipment. There is no Government inspection of butter, so that the branding is determined by the judgment of the shipper himself.

MARKET PRICES IN ENGLAND.

This year the price has run sometimes 135 shillings for our butter, which would be 26 cents net. That is the highest rate I have commanded myself, but others have run 140 shillings, which is an extremely high price. The average is from 90 to 125 shillings, according to the demand. I find we generally have very little trouble in realizing the quotations of the circulars, and sometimes we get over them.

CREAMERY BUTTER.

We occasionally purchase creamery butter in our section, but to a very limited extent. Creamery butter meets the requirements of the English market better than our ordinary butter, from the fact that it is shipped fresher, and we find that the first thing on reaching the market is to break down the prejudices of the people, for prejudices are very common there. The first thing to do is to make a name for the article, but if it is good it can be sold.

INJURY FROM FARMERS HOLDING BUTTER.

The great trouble with ordinary butter is that farmers hold it too long, and it loses its good qualities before it reaches the market. We can generally make up 50 or 100 tons for a shipment inside of a week, but farmers are very apt to hold it with the expectation of getting a better price. They would ultimately gain if they would sell it early, as their butter would gain in flavour.

DIFFERENCE IN MARKETS.

I find that markets differ, and sometimes I ship to London, sometimes to Manchester, sometimes to Bristol, but principally to Liverpool. I find that Bristol and London require fresher butter than either of the other places, owing to their having a different class of consumers. In Bristol we have to compete with the butter of the butter-producing counties around there. Stale butter will sell more rapidly in Liverpool than in London.

POPULARITY OF EASTERN TOWNSHIPS AND MORRISBURG BUTTER.

The butter from the Eastern Townships, that is south and east of Montreal, is in better favour in England than that from other sections in Canada. Morrisburg butter and Eastern Township butter are specially mentioned in their circulars.

WANT OF UNIFORMITY IN BUTTER AND PACKAGES.

Another great trouble with Canadian butter is that it lacks uniformity. The people of England are very particular as to the appearance of the article, and even the appearance of the package has a great deal to do with its sale, far more than it would have with us. We find in collecting a shipment that we have large and small packages, some clean, others seamed and discoloured, and when we get 1,000 packages with such a variety of appearances they make a very unseemly lot of stuff. The proportion of fine butter is really limited.

[Mr. Broder.]

THE IRISH, DUTCH, AND DANISH TRADE.

The Irish butter trade is not in so unsatisfactory a state. They can pack in a more inferior package than we can and it comes out better. The Dutch and Danish butter is known on the market by the appearance of its packages.

A DISTINCT FORM OF PACKAGE SUGGESTED.

If we were to adopt a particular form of package, and it became known as Canadian butter, I think it would have a decidedly favourable effect. I have had letters from my agents in England particularly requesting me to send a special form of package.

FALSE ECONOMY IN BUTTER TUBS.

The farming community look altogether too much to the price of the package, and if they can get an inferior tub at 5 cents less than a good one they will take it, thinking they are saving. We have coopers at every corner, each making tubs according to their own ideas, hence the variety. We have no tub factories worth speaking of. The tubs that the coopers turn out vary as much as the men do themselves. This would be an argument in favour of making butter on the wholesale plan like the creameries.

A GOOD FIFTY OR SIXTY POUND TUB THE BEST.

Last year we took pains to have the people pack their butter in uniform packages, all small. We had been using in that section of country a firkin holding about 110 lbs., but it was not satisfactory in England, because the grocers could not find customers who would take the whole package, and it was very inconvenient to handle on the counter. If they had a tub holding 50 or 60 pounds, they could turn it up on the counter, lift it off, and the butter would be clean. It has never occurred to me to supply my customers with tubs, though I have done so occasionally early in the spring.

COMPETITION AMONG BUYERS.—PRICES IN THE TOWNSHIPS.

There is a pretty sharp competition among buyers to get butter. The farmers all pack in their own packages. Eastern Township butter is generally quoted from $1\frac{1}{2}$ to 2 cents a pound higher than ours. They have a larger proportion of good makers than we have. It is made chiefly by farmers, but they have a fine country with rolling land, good water, and they have a larger proportion of the American element in their population.

PREFERENCE FOR CREAMERIES.

I should prefer that butter in our section should be made in creameries as far as trade is generally affected. It would be more beneficial to the country.

SHIPPING ARRANGEMENTS.

I have never taken a refrigerator room in the steamers at Montreal. When I shipped in warm weather I have always managed to get the butter stowed in the hold away from the heat. I have never suffered much by butter spoiling going across. I shipped last July and we had no trouble with the butter, but I attended to it myself until it was put on the vessel. The cars were properly iced on the way down. On the vessel no ice is used, it is simply packed in the best part of the ship. I have always found shippers very particular in caring for the butter, especially the Allan Line, and it generally arrives in good condition. My brother and myself were in business together, and he went

[*Mr. Broder.*]

over last year and stayed during the busiest part of the season, and reported, as different lots went over, how they arrived, and most of them arrived in pretty good condition.

SACKING THE TUBS.

Some have gone to the trouble of putting their tubs in coarse sacks and wrote over to see if this would be an advantage, but were told it arrived in such good condition that it would be a useless expense.

MARKS AND BRANDS ON BUTTER TUBS.

It is a very unwise thing to have many names on the tubs, and the name of the cooper should never appear on them. In England the people get it into their heads that all the different names are those of the people who make the butter. We plane everything off our tubs but the weight. If our butter was good average butter it would be well to have the words "Dominion of Canada" printed on the packages.

SHARP PRACTICE.

There was a time when our butter found its way across the line and they put our bad butter along with their own and called it all Canadian, and they took our good butter and, putting it with theirs, branded it American. At present we are shipping a good deal of our own butter ourselves.

CARE IN GRADING AND SHIPPING.

One way to remedy the prejudice against our butter is to be very careful in grading and very careful in shipping it. I have been very careful in that respect myself, and now we can sell our butter before it has arrived, simply on the brand. I cannot say whether it is sold to the retail grocer as Canadian butter, but I think it is.

CANADIAN BUTTER IN SCOTLAND.

There is a gentleman in our village who went over on a visit to Aberdeen, and a brother of his was very anxious to show him a tub of what he called American butter. He took him to the cellar and showed it to him and the Canadian found it was made within a few miles of his home, the name of the cooper being on the tub.

THE BROCKVILLE BRAND.

Brockville butter has long been famous. It is manufactured chiefly by farmers and shipped chiefly by persons in Brockville. There is very little of our butter goes to the United States.

VARIATION IN PRICES.

There is a difference of about 4 cents a pound between Morrisburg butter and Western Canada butter, that is on the round lot. I have sold ours at 125 shillings at the same time that I was selling butter shipped from Toronto at 98. The butter at 98 was graded A, B, and C. We get on an average about 3 cents a pound more for creamery butter than farm-made butter.

AMERICAN CREAMERY BUTTER.

There is a great deal of American creamery butter going to England now. They realize, judging from their circulars, about 4 to 5 cents more than our general run of butter does, and about 2 to 3 cents more than the Morrisburg or Brockville butter.

[*Mr. Broder.*]

CANADIAN CREAMERY BUTTER FIRST.

American creamery butter does not reach as high a price as Canadian creamery. The difference between Canadian creamery and our best is about 4 cents. There is about 7 cents difference between Western Canadian butter and creamery butter. I am speaking as to creamery butter from what finds its way to Montreal, and not from that in our own locality.

PREPARATION OF BUTTER PACKAGES.

People do not pay sufficient attention to preparing their packages for packing butter. A great many of our farmers will take a package to the pump and fill it full of water and set it in the sun, so that it is soaked in the inside and scorched on the outside. The result is that they are twisted into all shapes, and unfitted for holding brine, and they also become discoloured. Too much cannot be said about exercising care with packages. I do not believe in soaking them much in water.

MODE OF CLEANING—USEFUL SIZES.

They should be scalded out thoroughly with warm water and then rinsed with spring water to cool them. Adding a little brine is no injury, and perhaps may be a benefit, as a little salt in the water seems to take the taste of the wood away. There is nothing that cleanses them better than outtermilk, but we dare not recommend it because some of the people would not thoroughly cleanse them afterwards. The tubs should be about 56 pounds. I find that 25 pound packages do not keep the butter so well, because they are so small that the heat penetrates through them. The 56 pound package suits the trade better than the 100 pound one. Almost any size will do if the market is brisk, but we should have things in such a shape that we can take the market when it is dull. Those narrow-bottomed tubs which hold 100 pounds have too much surface exposed.

INCREASE IN TRADE AND IMPROVEMENT IN STOCK

To Mr. Dymond.—The production of butter is increasing, and the general character of our farm stock is improving. We grade these with the Ayrshire and some Durham, but principally with the Ayrshire, that is, Ayrshire bulls crossed on common cows.

THE STORE-KEEPER'S BUTTER TRADE.

It would be a great improvement to the trade if our store-keepers would stop trading in butter and allow it to be sold altogether for cash. Fifteen years ago we had just as poor butter in our section as anywhere, and the trade was carried on a great deal as it is now in the west, but buyers came and bought according to quality and the result was a great improvement in the quality.

PLAIN SPEAKING NECESSARY—FARMERS' WIVES.

When I am paying for butter I always tell the people when anything is wrong with it, and I think buyers are very much to blame themselves for the bad quality of butter. The store-keepers dare not tell the farmers' wives about the quality of their butter, but I find that people are anxious enough to find out the proper way of treating it.

ROOM FOR MORE STOCK.

I think there could be a good deal more stock kept in our district than there is now. Farming is good there and our land is kept pretty well up to its standard.

[*Mr. Broder.*]

THE STREAMS—THE SOIL—PRICE OF LAND.

We do not suffer much from drought. The soil is a loamy clay. The streams are mostly sluggish. Latterly the average price of land has been from \$25 to \$40 an acre. A few years ago it was from \$60 to \$70, and even higher. Plenty of farms can be bought now at from \$20 to \$40 an acre.

BETTER FARMING.

Generally speaking, the farm buildings are good. Farmers take pretty good care of their stock, and are beginning to feed better than they used to. There are not very many Durham cattle introduced. We have some Galloways. The farmers raise grain largely, but they also go into mixed farming. There is no soiling or anything of that kind except summer fallowing, which is done to kill out the weeds.

BROCKVILLE v. MORRISBURG.

To Mr. Wilson.—Brockville butter is not equal to Morrisburg butter, and is not quoted so high. It is a little more salt. The Brockville butter is, perhaps, as large in quantity as the other. Different farmers vary much as to the quantity they produce.

GRAIN CROPPING IN DUNDAS—BARLEY.

To Mr. Dymond.—Barley and oats are the principal grains with us. Most of the barley has been shipped to Scotland this year, though it sometimes finds its way to the United States. There has been no change in the character of the barley cultivated. It is a heavier grain than the Bay of Quinte barley, and is very bright in colour. It is the two-rowed barley. I would recommend an ash-wood tub to be used for butter, but it should be smooth and well finished.

To Mr. McMillan.—I would not like to recommend a large growth of two-rowed barley, because its export to Scotland only came up this year owing to the bad crop last year. The United States on the whole is the best market.

LESS SALT AND EARLIER SHIPMENT.

It would be well to put less salt in our butter and ship more freely throughout the early part of the season; it would then enter into consumption while fresh and well flavoured, and find more favour in the market.

MANUFACTURED BUTTERS.

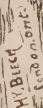
The manufactured butters (butterine, etc.,) shipped from Germany and the United States will be taken in preference to stale and off-flavoured dairy butter.

USE OF BRINE.

I would not advise putting brine on butter to keep during the summer months; it has a tendency to scald and interfere with the firmness and body of the butter. There should be no brine except that made by and from the salt put into the butter, and the tubs should be good enough to hold that.

A. BRODER.

[Mr. Broder.]



AYRSHIRE BULL.

EVIDENCE OF MR. BALLANTYNE, M.P.P

THOMAS BALLANTYNE, M.P.P., of Stratford, was called and examined.

THE CHEESE INDUSTRY—FORMER IMPORTATIONS.

To the Chairman.—I think previous to 1860 we imported cheese largely from the United States. Our imports for that year were about \$600,000 worth. The gentleman who did most to cause the great stimulus which was given to cheese dairying in Ontario was the late Harvey Farrington, of Herkimer county, N. Y., who settled in Oxford county, Ontario, about 1863 or 1864. He had been engaged in dairying all his lifetime, and probably in all respects a better man could not have been selected to do the work which was required of him at that time, and the benefits of which we are reaping to-day. The dairy-men of Canada certainly owe him a deep debt of gratitude for his efforts in the establishment of that industry.

ORIGIN OF CHEESE FACTORIES IN CANADA.

In 1866 there was an extraordinary extension of the dairying system, there having been possibly some seventy or eighty factories going into operation that year, and dairying has greatly extended ever since to the present time all over the western part of the peninsula.

ENGLISH MARKET—IMPROVED QUALITY OF CHEESE.

For a number of years I have been largely engaged in shipping cheese to England, and, of course, have had to study the requirements of the English market. The quality has greatly improved within the last few years; in fact it has improved to an extent that could not be conceived except by someone in the business, and at a late competitive test with the cheese of other parts of the world Canadian cheese was pronounced to be the best that was there.

INTERNATIONAL DAIRY FAIR.

I may mention that in 1878 there was an International Dairy Fair. Indeed we might go back even to the Philadelphia Exhibition, where the finest cheese exhibited was that from Canada. But in 1878 there was an International Dairy Fair in New York, where there was cheese from every cheese-producing State in the Union, from Canada and from England, both Cheshire and Cheddar. Well, the sweepstakes prize was given that year to three English Cheddars from Bath, England, the judges mentioning that the next best were three Canadian cheeses which I had the honour of selecting.

ANOTHER TRIAL—CANADIAN CHEESE THE PRIZE-WINNER.

Last fall a similar exhibition was held there which lasted for two weeks, and there were a great many entries of English cheese of both kinds. The sweepstakes prize was given to three Canadian cheeses.

COMPARISON WITH ENGLISH CHEESE.

That fact might suggest to us the question how our fine goods compare with the finest English cheddar, and from my knowledge of the business, and having been in England every year for the last ten years, I would say that there is a small portion of fine English Cheddar that is considered superior to our best Canadian; but our best fall cheese—that made in the latter part of August or in September or October—would obtain a higher price in

[*Mr. Ballantyne.*]

England than 80 per cent. of English Cheddar. There is still doubtless a prejudice among certain classes in England in favour of their own goods.

PRECAUTIONS TO BE OBSERVED.

The process of cheese-making, as generally followed, has been so minutely described by Mr. Macpherson that it is hardly necessary for me to say much about it; but we cannot impress too strongly on patrons and all connected with the factories, the necessity of using every care and precaution in the way of cleanliness, and having buildings suitable for the purpose, so that the cheese may be kept up to a recognized standard of quality.

THE CHEDDAR SYSTEM—STILTON CHEESE.

Our cheese are all made on the Cheddar principle. I only know of one small dairy in the neighbourhood of Guelph where Stiltons are made. I do not think there is another. Of course the making of Stilton cheese is not adapted to the ordinary factory system.

A PROFITABLE INDUSTRY—CONDITIONS.

I think that dairying has, on the whole, been a very profitable industry where it has been prosecuted energetically and intelligently, and by a class of farmers who understand the necessity of giving proper attention to their part of the business. If cows are not properly selected and properly kept, and if the most scrupulous cleanliness is not observed in the utensils that are used, and the carrying of the milk to the factory, the system will be a failure. Though the result has been generally satisfactory, there have been many signal failures arising altogether from lack of attention to these matters.

A LARGE DISTRICT FOR CREAMERIES.

We have a large part of the peninsula between the Grand Trunk Railway and the Georgian Bay where there has been almost no dairying carried on, and it has appeared to me that in that district, if any one who understood the business were to take hold of the matter, the establishment of creameries might be made a profitable business.

THE FAIRLAMB SYSTEM RECOMMENDED.

The plan by which the cream only is taken to the factory it seems to me would get over the whole difficulty, and I think it only requires to be introduced to come into general effect in a few years in that part of the peninsula. I have no doubt that it would increase the value of the product to the amount stated by previous witnesses.

OBSERVATIONS IN THE STATES.

It is only lately that the system has been introduced into the West, and this spring I made a tour through that country and found that in every case it proved a complete success. There is no doubt in my mind that it will take the place altogether of private dairies.

PRACTICE IN ILLINOIS AND OHIO.

In Illinois they are on the old system, making butter and skim-milk cheese, and they are not likely to change, especially as they have a market for their skim-milk cheese in the south. They think that these two industries combined are the most profitable. The milk is all taken to the factory just as to the cheese factories. Then they take so much butter, one, or two, or three pounds of the quantity required to make a pound of butter, and the balance is made into skim-milk cheese, very much skimmed or partially skimmed,

[*Mr. Ballantyne.*]

according to the season or the market. In Ohio they follow the same plan. There it is all butter and skim-milk cheese, but I certainly would not recommend that in Canada.

REPUTATION OF CANADIAN CHEESE.

Our cheese at present has a very high reputation, one reason being that dealers can handle Canadian cheese with freedom, and confidence that there has been no partial skimming done. In the old dairy districts of New York, when they attempted partial skimming, they found that they lost by it, as their cheese has not that fine nutty, melting taste in the mouth that is only obtained by full milk. Of course, there was no dairying comparatively before the introduction of the factory system, so that we have not had the difficulty of private dairies to contend with.

OVERSIGHT OF FACTORIES—A UNIFORM STANDARD DESIRABLE.

I am much impressed with the fact that if one man was to have the management of a number of dairies, it would very materially raise the standard of our cheese. Dairying has been long carried on in Herkimer and Oneida counties, New York, and it was from there that the factory system extended to western New York, Pennsylvania, and Canada.

THE SYSTEM IN NEW YORK STATE.

In western New York there was a small proportion of the factories that were very successful, but some of the men who were successful have bought out the other factories, one by one, until there is what we call the Western New York Combination, one man owning twenty, another man ten, and so on, and nearly all the cheese is manufactured in that way. The change in the system has entirely altered the character of their goods, and it now ranks very much higher than the cheese which comes from factories under separate and varied management.

TOO MUCH DIFFERENCE IN CANADIAN CHEESE.

To Mr. Dymond.—As the result of trials showed, we have cheese superior to theirs, but there are many factories which would, doubtless, be greatly improved if this system were adopted. We have many factories making a poor or medium cheese, whereas, if they were put under the management of competent men, they might all produce a uniformly fine quality of cheese.

WORKING BLINDLY.

These factories go on making cheese from year to year, the men in charge probably imperfectly understanding their business, but working along, seeing that something in the process is not right, but not knowing what it is, whereas a skilled cheese-maker could at once detect what was wrong and apply the remedy. I have seen very many illustrations of this, and I have endeavoured myself to do a good deal in the way of educating dairymen to a proper understanding of their business. I have always regretted that this matter has not been more strongly urged. When I was in New York last fall, and driving among the factories of these combinations, you could scarcely tell the difference of quality in any single cheese of their product, but we have no such uniformity here. Then they are able to buy the articles required in large quantities, and they get them cheaper, and being better judges of them, are less liable to be imposed upon.

HOW THE COMBINED SYSTEM ORIGINATED IN NEW YORK.

In the New York dairies it was by a mere accident that the system was adopted in the first place. A number of the factories were dying, when they were bought at nominal prices by first-class men—shrewd, intelligent men—who thoroughly understood the business and the result was that, in their hands, the factories were successful.

[*Mr. Ballantyne.*]

CERTAIN IMPROVEMENT.

Any one who understands the cheese business, and has had the opportunities for observation which I have had, can at once see the great improvement which would result from the adoption of the system—a system which, in my opinion, is as much in advance of the common method as the factory system is ahead of private dairying.

MAKING BY CONTRACT.

To Mr. Dymond.—There would be no difficulty in a person with such qualifications as I have mentioned contracting to manufacture the cheese at a certain sum per pound, while the property might be placed in such a shape that it could be resumed by the patrons at any time.

ALL EQUALLY INTERESTED.

There would be no difficulty in getting such an arrangement made if the factories realized that their interests were largely identical—that all are interested in improving the quality of the cheese, and that every pound of poor cheese diminished the value of the whole product. Of course there is likely to be some jealousy among people in the same line of business. Some men are quite willing to have the reputation of making better cheese than their neighbours, whereas, if their neighbour's cheese was as good, they would certainly be getting a higher price. Companies might manage their own business, and have men to do the manufacturing.

MANY INCOMPETENT CHEESE-MAKERS.

A great many who are manufacturing cheese are doing it to a certain extent by chance, sometimes hitting the right process and sometimes missing it, but doing nothing on scientific principles, and they have nobody to tell them how things should be done. This state of things may go on for months; they may have fine cheese one month, and a very bad article next month, which could not occur if the factory was along with a number of others, under the superintendence of a fully competent man.

BETTER BUILDINGS—TEMPERATURE.

In some localities it is desirable that more care should be taken in the buildings—having better curing rooms, with more control over the temperature. Too high a temperature is destructive of the cheese, just as too low a temperature.

PREJUDICES REMOVED.

At one time it was with cheese as with butter—there was a strong prejudice in the English market against the Canadian article, but we have outlived that. It arose, I presume, from the fact that there were so many making cheese, and there was not a sufficient number of competent men to do the work. Looking at a lot of Canadian cheese which I once shipped to a gentleman in London, I asked him how they would compare with the finest English Cheddars. He said, he did not know where he could buy a ton of as fine English Cheddars, though there was a limited quantity supposed to be finer, but it would sell at a higher price. Our fine fall cheese sells for a higher price than possibly 80 per cent. of English Cheddars. Summer cheese, of course, is not equal to fall. It is shipped to England as it is ready, and sold for immediate consumption. It is worse than it need be if we had better curing rooms, but under no circumstances would it be equal to fall cheese, which contains a greater proportion of butter.

[*Mr. Ballantyne.*]

IMPROVED FACTORIES—COST OF ERECTION.

A great many of the factories originally put up are very deficient; but the factories recently put up are a great improvement upon them. The cost of erection depends upon the amount of business which the factory is expected to do. I put up one two years ago which cost, perhaps, altogether about \$7,000. One for 1,000 cows would cost about \$5,000 or \$6,000.

EASTERN SHIPMENTS—DAIRYMEN'S ASSOCIATION.

The amount shipped from Belleville is very large. We formed a Dairymen's Association in 1866. At that time it was called the Canadian Dairymen's Association, and embraced the whole Province. Since that time another one has been formed. The original one was purely voluntary; we did not contemplate receiving any Government assistance. In time we got a grant, and then had to make arrangements for meeting in both the east and the west—going to Belleville every third year, and holding the shows in the same way.

DAIRYMEN'S MEETINGS.

It was felt desirable however, that we should have a meeting in the west every year, as there were matters of interest constantly coming up for discussion, sufficient to call for annual meetings. The meetings were exceedingly well-attended; in fact they were the largest gatherings of people connected with farming held anywhere in the country. There has been all along a free interchange of opinions on everything bearing on the subject of cheese. And this fact has doubtless contributed largely to the improvement which has taken place. It was finally decided to have the Act so amended that there should be a meeting in the east and one in the west every year. The division is made for the purpose of local convenience. We usually have some members from the west attending the Eastern Convention and *vice versa*. Toronto is about the dividing line between the two.

DISCUSSIONS ABOUT CREAMERIES AND OTHER TOPICS.

The subject of creameries has been discussed at these meetings. The Association has urged the question upon the consideration of its members, but those who attend the conventions are almost exclusively engaged in cheese manufacture, so that little has been accomplished. The question of joint management has been taken up, but we have no factories conducted in that way in the west. Being President last year, I intended to have brought the question more prominently before the Association, but illness prevented me from attending the meeting, and the question was not taken up.

MEN WELL QUALIFIED AS MANAGERS.

I do not see any insurmountable difficulties in the way of carrying out such a system. We have a number of men well-qualified to superintend a number of factories, and if they were to be placed over them, we would soon see the benefit. So far as experience in cheese-making goes, we are just about as old as anywhere else on the continent.

CAUSES OF IMPROVEMENTS IN CHEESE-MAKING.

The industry had only been established a few years before it was introduced into Canada; little progress had been made, and the principles of the art were very imperfectly understood, and as a consequence, the quality of the goods was poor. It has been, in consequence of the establishment of these Associations, and the employment of the best minds connected with the business, that the wonderful improvement of the last few years has taken place. We are further advanced in the art than they are in England.

[*Mr. Ballantyne.*]

THE COST OF MAKING CHEESE.

The rate per pound paid differs very much: one man can make 10 at one cent and have it pay better than another at 1½. The price mentioned by Mr. Macpherson is about the average. It would not cost so much as that on the self-managing plan, but of course, there is the interest on capital, and the depreciation of stock.

THE JOINT-STOCK SYSTEM.

Small joint-stock factories have not been successful where there has been a small number of patrons—at least only in certain localities. There are localities where dairying has done well, but would have been a failure on the joint-stock principle. Where we have well-to-do, intelligent farmers making a business of dairying, I think the joint-stock principle is the correct one, but in other districts it would not do. It requires an active, energetic man to start the people up, and educate them into everything that is required.

PROFESSOR ARNOLD'S VISIT.

To the Chairman.—Mr. Arnold's first visit to Canada was not successful. He came in May, and his mode of illustrating things at that time had a bad result. Latterly, I think, his efforts have been productive of a great deal of good. So far as my observation goes, nearly the whole of our cheese-makers are practising to some extent what he advocated—that is the drawing of the whey earlier than had formerly been done.

GOOD EFFECTS.

There was nothing else of any consequence in his illustrations. The mere visiting of factories and talking to people about Rennets and other matters of that kind had an excellent effect. I never saw the cheese product so uniform as it is this spring, though that may not perhaps be wholly due to the practice of drawing the whey earlier. The weather seemed very favourable.

COWS FOR DAIRY PURPOSES—AYRSHIRES.

To Mr. Dymond.—I agree on the whole with what has been said as to the best kind of cows for dairy purposes. Grade Durhams will answer the purpose, but so far as my observation goes there are comparatively few nearly thoroughbred Durhams that are good milkers. I have seen good stock raised by crossing grade cows with Ayrshire bulls. I once bought two Ayrshire bulls for that purpose, and they produced the finest milkers I have seen. The grades in that case were crosses between a Durham and the native cows. It is possible that the original native cows are Ayrshire to some extent. They partake of the Ayrshire character to some extent.

To the Chairman.—I think that perhaps a cross between our native cows and Ayrshire bulls would be the best milkers.

HOLSTEIN CATTLE.

My attention has lately been called to the Holstein cattle, through a gentleman who owns a herd of that breed in New Jersey; they are bred and kept chiefly in Holland, where the greatest attention is paid to the development of the cow's milk-producing qualities, as the small farms would not permit the keeping of inferior cows. The cows I refer to were owned by a nephew of Gov. Seymour, of New Jersey.

[*Mr. Ballantyne.*]



JERSEY BULL.

ENORMOUS YIELD OF MILK.

One of them yielded, after her first calf, 8,900 lbs. of milk during the season—of probably not more than 300 days. These cows were shown at the International Dairy Fair at New York last December. The other cow, for 12 days, gave $118\frac{3}{4}$ lbs. per day—or for the season 12,600 lbs. I have no doubt, from what I have read and heard, that we have no cow equal to the Holstein for dairy purposes.

DESCRIPTION OF HOLSTEIN CATTLE.

They are a distinct breed with marked characteristics, spotted black and white. They have a larger frame than the Ayrshires, and are not so handsome as the Durhams, but are of fair size. They are horned cattle. The owner imported these cows himself. He was in Holland on a trip, and he told me that he took great precautions in selecting them, so that probably they were extra good animals. He mentioned the price he paid, but I forget it. It was not excessive, however.

MILKING *v.* BEEFING.

They are fair beef-yielding animals. None of the dairy breeds are particularly adapted for fattening. My idea is that if you are breeding stock for the dairy, you cannot afford to consider anything else, just as in breeding beef for the shambles, you have to look only to their fattening properties and their propensity for arriving at early maturity. If you get a good dairy animal it will pay more in a season than you could realize from it for beef under any circumstances.

DAIRYMEN NOT RAISING STOCK.

To Mr. Dymond.—There are no better milkers than the grade Durhams. Dairymen, as a rule, do not consider it profitable to raise their own stock. That is the opinion among those who practise dairying, though some do raise their own stock. The theory is that it will not pay, as they will make as much out of a cow in a season as a heifer would be worth when she is three years old, and her keep is saved. Still by breeding along, and keeping the calves from cows of a milking family, a better herd of deep milkers could be got than could be obtained otherwise. If I were dairying I would not think of raising my stock. I would sell the cows when they became useless, and always be on the look out for good milkers, as a good cow will pay for herself in a season. The general opinion is that if heifers are well adapted for dairying, two years old is the best time to bring them in, and that if they are not brought in then, they will develop into fat instead of milk-giving qualities. This is the rule in dairying counties, I think.

T. BALLANTYNE,

Sittings to take oral evidence, held at Seaforth, August 11th and 12th, 1880.
Present—Mr. McMILLAN (Chairman) and Mr. DYMOND.

MR. W. SCOTT ROBERTSON'S EVIDENCE.

THE BUTTER TRADE.

I never manufactured butter in a factory; I buy it now from the farmers. It is a pretty large interest in this neighbourhood. The largest of our farmers will not make more than 20 or 25 tubs in the season—that is, about 1000 lbs.

[*Mr. Robertson.*]

SALT—WANT OF CARE IN DAIRIES.

They are using Canadian salt generally. Last year some of them tried English salt at my request, but it made no difference in the butter. The trouble with our butter is that it is badly made and badly kept, and that I think is the reason it has a bitter, strong flavour, and not the salt. I have had just as fine butter as I ever tasted in my life made with Canadian salt.

WANT OF UNIFORMITY.

The most of the butter I buy is shipped to the English market. It comes to us in all shapes—in crocks, pails and tubs. If it is in tubs, we fix it up in as good shape as possible, and keep it in our cellar. If it is loose, we have to sort it, according to colour, and if necessary, re-salt it and pack it away again. It comes to us in all colours and qualities, and we have sometimes to mix it to get it uniform.

PRICES FOR DAIRY BUTTER.

There is practically no standard for our butter. We are paying from 12 to 16 cents for the best tubs; we have given more; the price depends on the season and the demand. Creamery butter to-day is worth 24 cents, while farmers' dairy butter does not bring more than 16 cents—the best quality.

SHIPMENTS TO ENGLAND.

I ship to England on consignment for sale. English buyers like Eastern Township butter very much, but our western butter always sells as a very low grade. Morrisburg and Brockville butter is classed very nearly as high as Eastern Township.

ONTARIO WESTERN BUTTER—BAD DAIRYING.

The reason the western butter has such a poor reputation is that farmers' wives have very poor conveniences for keeping their butter as well as for making it. They make such small quantities at a time that they have to mix stale and fresh cream together. The great difficulty with our butter is that it gives off its flavour, with all we can do.

WORKING THE BUTTER—TUBS.

The butter we work sells rather low; it should never be worked after it leaves the farmers; there are different kinds of tubs made here—those with sawn staves, and those with the old-fashioned split staves. I prefer the tub with the split stave, provided it is made as cheaply as the sawn stave tub. It seems to hold the brine better, and to enable them to turn the butter out easier in England. If our tubs could be made smoother inside so that the butter could easily be got out, it would bring better prices.]

BRANDS—INSPECTION NEEDED.

We do not put any brand on our butter; we do not even mark it Canadian butter. There is no official inspection of the butter. I think an inspection of butter will be the only way to give our butter a standard, on the same principle as the cheese. I have been connected with cheese and butter business for about ten years.

WALTER SCOTT ROBERTSON.

[*Mr. Robertson.*]

MR. EDWARD CASH'S EVIDENCE.

EDWARD CASH, of Seaforth, was called and examined.

BUTTER BUYING AND SHIPPING.

To Mr. Dymond.—I am now engaged in buying butter from the makers, and I have been a dealer in butter for the better part of thirty years. I heard Mr. Robertson's evidence which has just been given with regard to butter, and I agree, generally, with the views expressed.

CONTINGENCIES—STOCK—BUTTER MAKING.

There are a great many contingencies regulating the successful making of butter. Besides the salt used, there is first the proper treatment of the stock in the matter of supplying wholesome food and water; second, the convenience for keeping and treatment of the milk, and then the making and handling of the butter.

IMPROVEMENTS IN VARIOUS WAYS.

There has been a great improvement in this neighbourhood in the quality of the stock raised, and in the means of keeping and treating the product of the dairy. Oil cake is not used by the farmers about here to any extent. Our farmers raise their stock chiefly with a view to dairying; but of late there have been quite a number of cattle fed for the English market.

CAUSES OF INFERIOR QUALITY.

My experience as to the general character of the butter products in this district leads me to think that one fruitful source of poor butter is owing to many parties attempting to make butter from too few cows; keeping the cream too long, and having too many churnings in one package of butter. Butter made in the hot season is generally poor. Dairies of eight or ten cows, and churning every twenty-four hours, other things being equal, the butter will be equal to creamery. Of late there has been a decided improvement in the quality of our butter owing to the better education of the people in these matters.

A GOOD DAIRYING DISTRICT.

This district is generally well watered; there was formerly a large quantity of butter made around here, but it has been pretty well divided between cheese and butter. Butter has not made the progress that cheese has during the past few years. I think many of my patrons can make butter quite as good as creamery; the advantage of creamery butter is its uniformity of quality and colour.

THE STORE SYSTEM BAD.

A great drawback to the improvement in butter is owing to the truck and trading for it in the stores, the mixing of too many quantities and qualities together destroying much good butter.

THE SALT USED—HANDLING—PACKAGES.

Formerly the Oswego salt was largely used in this county for all purposes. Butter makers now generally use Canadian salt. I do not export butter to England myself. I generally sell to shippers in round lots. I think a good deal of our butter would sell equal to creamery, if properly handled and classified. I think it would improve our butter if

[*Mr Cash.*]

small dairymen would churn often and use smaller packages for butter. As a rule, there are not many farmers engaged in butter making around here who have more than eight cows.

POSSIBLE CAUSES OF COMPLAINT.

To Mr. McMillan.—I have not observed any difference in the quality of butter from the use of any particular kind of salt. Private customers have reported some packages of butter as keeping perfectly sweet for eight or nine months, while others made with equal advantages would not keep in flavour two months; it is difficult to tell the cause, it may be from over-working; it may be from noxious weeds or herbs eaten by the cows in feeding; or the milk not properly divested of it; any of these will be against butter retaining its sweetness.

EDWARD CASH.

Sitting to take oral evidence held at Teeswater, August 13th, 1880. *Present*—Messrs. McMILLAN (Chairman), and DYMOND.

MR. JOHN HETTLE'S EVIDENCE.

JOHN HETTLE, Manager of the Teeswater Creamery and Cheese Factory, was called and examined.

A CREAMERY IN OPERATION.

To Mr. Dymond.—I have been engaged in butter-making six, and in cheese-making three years. The Teeswater factory adopts the place of purchasing the milk from the farmers and making butter and skim cheese. We collect the milk from the farms. We pay seven cents per gallon for the months of May and June, and six cents for July and August, and seven for the balance of the season. We run from about the 10th May to the 10th November. We started the skim cheese making in 1878. Previously we ran butter alone and fed the skim milk to hogs. We have found our present plan more economical and profitable in ordinary seasons. From 35lbs. of milk we average 1lb. of butter and 2½lbs. of cheese. The gallon of milk weighs 10lbs. The farmers generally are taking advantage of the system. Last year we ran up to 22,000lbs. of milk per day in the height of the season, representing nearly 1,000 cows. Farmers are feeding their cows better and going in more heartily for dairying. I have advised the use of oil cake as a feed but not with much success. I circulated a number of the reports of the Dairy-men's Convention, held in London in February last, among the farmers. Some four other butter factories have been established within twenty miles of this place, probably as the result of our experiment.

PRICES REALIZED.

In 1877 we sold the season's butter here at 25 cents. In 1878 the price of butter was lower and we realized 22½ cents. In 1879 the trade being very dull we got 17 cents. That was before the decided rise in the fall of that year. This year we have been offered 24 cents, but have sold none, and are holding for better prices. In 1877 a British merchant bought farmer's butter of the usual quality at 17 cents and gave us 25 cents. We understood he realized a handsome profit on the creamery butter, but lost on the other. In 1878 farmer's butter was worth 12 cents to 14 cents, and in 1879, up to the middle of September, as against our 17 cents, farmer's butter was sold for 8 cents. Eight cents per pound will be the fair average amount of the difference in favour of creamery butter.

SKIMMED MILK CHEESE.

We have realized for the cheese made from the skim milk in 1878, 7 cents; in 1879 [*Mr. Hettle.*]



HOLSTEIN COW.

the trade was very dull, and we made hardly any, finding it more profitable to feed it to pigs. At present the prospects are very good. The skimming takes place about seventeen hours after cooling. The difference in price between the skim cheese and the ordinary cheese is about 2 cents per lb. The quantity of cream retained in the skimmed milk varies according to the conditions of temperature.

TUBS—SALT.

The butter is all sold in 56lb. tubs. About three-quarters of an ounce of salt is used for every pound of butter when stored for future shipment; but not over half an ounce per lb. where the butter is shipped every month. We have generally used Seaforth salt both for butter and cheese. We have never had any fault found with the butter. Where the Liverpool salt and Canadian salt have been used for the same shipments no trace of difference could be discovered on examination. No buyer has ever complained to us of the salt used. We brine the butter frequently and keep it moist when in store. The same remark applies to the salt used in the cheese-making as in the butter. We are just now using Liverpool salt, but I can discover no advantage it possesses over the Canadian.

FEEDING HOGS.

We are feeding hogs on the butter-milk. We recently sold 120 for shipment to Liverpool, at 5 cents per lb. live weight. We have to take what hogs we can get, but a well-bred hog is most profitable, and fattens much easier than a common one. I should prefer the Berkshires if I could make a choice. Our butter is all branded "Teeswater Creamery, Teeswater, Canada," as a distinctive mark. Inquiries have in many instances been made by letter and cable from England for our brand of butter. Our means of providing are practically unlimited if the farmers will only supply the milk. Farmer's butter is far more heavily salted than ours. We have paid this year to farmers sending milk to us, for three months' milk, \$7,981. That was up to the 1st of August.

JOHN HETTLER.

Sittings to take oral evidence, held at Perth, October 12th, 1880. *Present*—Messrs. BYRNE (Chairman), and DYMOND.

MR. ROBERT MEIGHAN'S EVIDENCE.

Mr. ROBERT MEIGHAN called and examined.

To Mr. Dymond.—I am a merchant in Perth, a member of the firm of A. Meighan & Brothers.

LARGE TRANSACTIONS IN BUTTER—PREFERABLE SIZE OF TUBS.

We buy largely all produce raised in this section. Some \$50,000 worth of butter will, I expect, pass through our hands this season. We usually buy direct from the farmer in 50 lb., 80 lb., and 100 lb. packages. We prefer the 50 lb.; they suit some old country markets, especially Glasgow, best. It is all dairy-made butter.

AVERAGE OF PRICE—POOR QUALITIES A DRAWBACK.

Taking the past seven years, I think the price would have averaged 19 cents. The highest price we have paid was 25 cents, and the lowest for good samples 12½ cents. It [Mr. Meighan.]

varies much in quality. We can sell all the good butter, but the poor quality is a drawback. About two-thirds would be our best shipping brand; the rest would be seconds and thirds.

REPUTATION OF BEST BRANDS.

Our best brand is well known, and stands well in the English market. We can place it by cable on its own reputation. It brings the highest price of Canadian brands excepting the Eastern Townships and Morrisburg. Brockville brand has fetched lately 115 shillings per cwt. Our best brands are not so even in quality as the Townships, or even the Morrisburg.

ROOM FOR IMPROVEMENT.

I believe one reason is, the farmer here has not been taught to improve his butter by the merchants who were reluctant to tell him his butter was inferior. We examine it carefully when it comes in and appraise it accordingly. There has been a decided improvement lately in the butter of the section. I think the low prices of late years, and public attention being called to the subject by the press, has led to improvement. We get our best butter from the high lands.

HIGH QUALITY COMMANDING HIGH PRICES.

I believe the quality of the Eastern Townships butter is decidedly ahead of our best. I obtained some butter from special dairies from this neighbourhood and put it on the market in England on its own merits. It brought an exceptionally high price, and buyers wanted more of the same mark.

RESULTS OF CARELESS DAIRYING.

Careless making is the chief cause of complaint. The buttermilk is not taken out, too much salt is used, and the colour is not regular in the same package. There are no creameries in the neighbourhood.

CREAMERY BUTTER.

Creamery butter brings a higher price by 3 or 4 cents over our finest.

OLEOMARGARINE.

The oleomargarine is interfering with the lower grades of butter. The only way to compete with this is to produce the finest qualities. I have no personal interest opposed to the creamery system.

MODE OF BRANDING.

We brand our best butter "Choice Dairy Butter, A. M., Perth, Ontario, Canada." "A. M." has been our old mark.

THE CHEESE TRADE INCREASING.

We have bought most of the cheese from the factories in this section this year. The product through our hands has been equal to some \$40,000 in value. This is probably four-fifths of the whole. Cheese-making is on the increase; the business is better managed. The adoption of the co-operative system by the farmers has helped to improve the business.

DAIRYING v. WHEAT CROPPING.

While some farmers who have continued to grow wheat have become more heavily encumbered, those that have gone into dairying have been clearing off their indebtedness.

[Mr. Meighan.]



SHORTHORN COW.

ENGLISH SALT PREFERRED.

We prefer English salt, of Higgins' brand, for butter making. The butter appears to take better—with the English buyers. The other salt used does not appear to dissolve so easily as the English. Since we commenced to use Higgins' "Eureka" we have had few complaints. I cannot tell what Canadian salt has been used. We had many complaints, but I cannot say the salt was Canadian. I do not know positively any of the salt complained of was Canadian.

GRAIN PURCHASES—THE RYE CROP.

We buy grain largely. The demand for rye for export to Germany and Belgium has been largely on the increase. I think the trade will continue from natural causes. Our reports from Antwerp are that the sample gave great satisfaction. The impression of the trade is, that our rye is superior to the American. Farmers say they can grow it on poorer land than other grain crops. I am buying at 78 cents to-day for a good sample. Where freights are cheaper it will bring 80 cents, and at Toronto it is up to 85 cents. I know farmers who have substituted rye for wheat with profit. Previous to 1879, I think, 50 cents was the highest price we ever gave for rye.

ROBERT MEIGHAN.

MR. JOSEPH YUILL'S EVIDENCE.

A PRIVATE CREAMERY.

Extract from evidence on Ayrshire cattle, given at a sitting of the Commission held at Almonte, October 13th, 1880.

Present—Messrs. E. BYRNE (Chairman), and A. H. DYMOND.

PRIVATE CREAMERY ARRANGEMENTS.

"We have a small private creamery and make our own butter. . . . Some of the stock are young, but 200 lbs. of butter would be a fair season's average to a cow. . .

DESCRIPTION OF THE UTENSILS.

Our creamery is calculated for 15 cows. It is known as Evans' Creamery, and consists of five cans costing \$25. They are about two feet high, of seven or eight inches in diameter, and in two parts connected by a narrow neck with a stopper. The lower portion will hold about fifteen quarts and the upper five quarts. The cream is suffered to fill the upper part of the vessel. The stopper is inserted, and the upper part of the vessel can then be easily removed.

TREATMENT OF THE MILK.

The milk vessels are immersed in cold spring or iced water for twelve hours until the
[Mr. Yuill.]

cream has risen. The cream is then put into another vessel to ripen for about thirty-six hours, and then churned by a dog power in an old-fashioned churn.

PRICES FOR BUTTER.

We get twenty-one cents a pound for the butter. We use an ounce of salt to the pound of butter and a little saltpetre. We always use the ground Liverpool salt.

JOSEPH YUILL

Sittings to take oral evidence, held at Belleville, October 18, 1880. *Present*—Messrs. AYLSWORTH (Chairman), and DYMOND.

MR. P. DALY'S EVIDENCE.

PETER DALY, of the Township of Thurlow, was called and examined.

He said:—I am engaged in general farming as well as dairying. I can corroborate the most of the evidence given by Mr. Graham, but I differ from him on some points. I do not get such results from my dairying as Mr. Graham, as I keep my cows more cheaply, and have a rougher farm.

MANAGEMENT OF A DAIRY FARM.

I aim to have my cows milking about the middle of April or the first of May. I feed them a good deal of straw in the spring, and not much grain, but I have no trouble in keeping up a good flow of milk. When the pastures stint I do not feed them any grain, but depend mostly on the pastures. I do not soil my cows or feed them any hay or grain until the snow falls, and I find that my cows give a larger yield of milk in the fall than those which begin giving milk in March, and feeding on grain.

PASTURAGE.

For pasture I prefer fields that have lain long in sod, rather than fields that have been newly seeded with clover and Timothy or both. The longer a field lies in pasture the better the pasture grows. For dairy purposes there is no grass equal to the June grass, and in order to obtain good June grass we have to abandon rotation of crops.

CORN STALKS FOR WINTER FEED—MEAL.

I depend on corn stalks for early winter feed, as I raise six or seven acres of corn every year and regard corn stalks as invaluable food for cows. About the middle of January, when I cease to milk the cows, I put them on straw with a very little meal—say one quart a day. In other respects my practice does not differ much from Mr. Graham's.

AVERAGE RETURN PER COW.

I obtain on an average about \$30 per cow for the milk sent to the factory, and besides this I make between 400 and 500 pounds of butter, or about \$6 per cow. The calf is worth \$1, or if kept till fall, \$5 or \$6, making about \$40 per head as the average proceeds.

COST OF FEED.

I do not feed my cows over one ton of hay each per annum, which costs \$8 or \$9. [*Mr. Daly.*]

The pasture costs about \$6 for the season, and \$1 will pay for the meal. I calculate that the manure is worth, at least, as much as the straw, so that \$15 or \$16 would be about the total cost of keeping a cow. I do not raise many calves, but supply myself by purchasing.

CHEESE PRODUCT OF THE DISTRICT.

As to the amount of cheese produced in this district I have consulted two buyers whose operations extend from about Newburgh, some seven or eight miles beyond Napanee to the west of the Bay of Quinte, including Brighton and Colborne; in fact, they buy nearly the whole of the cheese in this district. Their estimate of the amount purchased is 190,000 boxes of sixty pounds each, at an average of about 11 cents per pound. Other buyers purchase smaller quantities in certain portions of the district.

ROTATION OF CROPS.

My rotation of crops is somewhat different from Mr Graham's. I have a good deal of long manure in the spring, which is turned over into heaps, and after I have sown my barley, I draw it out and put it on the corn and potato ground. Next spring I turn over the land and sow barley upon it, taking off two and perhaps even three crops, and seeding down with the last. When I plough up the sod I sow peas or oats upon it. I keep the land in pasture or grass three or four years.

USE OF HURON SALT.

Huron salt is used in the cheese factory of which I am President, but I do not know what particular brand it is. I have no reason to think it is otherwise than satisfactory, and the buyers find no fault, though they are both interested in English salt.

CULTIVATION OF RYE—WHEAT—APPLES.

I think the cultivation of rye to a moderate extent is profitable on account of the value of the straw for feeding. Spring wheat has been running out for a number of years, and though new sorts have been tried, I am of the opinion that as a crop it is a failure. Fall wheat does well. All kinds of apples succeed well. Leached ashes I consider the best fertilizer for an orchard.

PETER R. DALY.

[Mr. Daly.]

MR. THOMAS MYERS' EVIDENCE.

STATEMENT OF MR. THOMAS MYERS, OF THE TOWNSHIP OF BASTARD, COUNTY OF
LEEDS ON DAIRY FARMING, ETC.

Mr. Myers having been prevented from attending, as notified, the sittings of the Commission at Perth, subsequently made the following statement to Mr. Edward Byrne, one of the Commissioners :—

November 25th, 1880.

Mr. MYERS said :—I was born and have been brought up on the farm on which I now reside. I have been engaged in farming all my life. I own 400 acres of land. I grow grain largely, but have latterly devoted my attention chiefly to dairying. The lot on which I now live was given me by my father.

AN IMPOVERISHED FARM.

The soil is naturally good, but it was the farthest removed from the homestead buildings, and consequently during my father's time, it received little or no manure. When I came to work it my crops were very inferior, particularly wheat. I was then forced to the conclusion that I must adopt some means of improving this worn-out soil.

INCREASE IN STOCK.

I increased my stock of cows, and have profited in a two-fold capacity. My land is fast improving, and my pecuniary affairs in equal proportion.

A GOOD DAIRYING SECTION.

This section of country is well adapted for dairy purposes. There is abundance of good spring water, and lying contiguous to the Rideau waters, the land affords delicious pasturage in summer.

CHEESE FACTORIES.

Cheese factories are very numerous in this section of the country, and seem to increase in public favour. The average number of cows to each factory is about 350. The factories are all, with one exception, conducted by private enterprise.

CHEESE MAKING.

I have been engaged for the past twelve years in cheese making. I ran a factory in company with another gentleman for seven years, but dissolved partnership because I thought that I could make better sales alone, and the result has proved very satisfactory to me. When I was ready to sell, my partner was not, and the fact became quite apparent to me that too many salesmen are a great injury to a cheese industry.

A SMALL FARM FACTORY.

After dissolving partnership I erected a cheese factory on my own farm, a small one in proportion to the one we had before. It cost, exclusive of my own work, about \$450. I keep 40 cows, and make cheese for any of my neighbours that deliver their own milk, but never haul any milk. When milk is drawn a long distance, the result is never satisfactory, either in the quality or the quantity of cheese made therefrom.

[Mr. Myers.]

HEIFERS—COWS—HEALTH OF STOCK.

Generally my heifers come in at two years old. I never had any trouble with abortion. My cows are healthy, and no disease of any kind prevails in this section amongst cattle.

WINTER SHELTER AND FEED.

I keep my cows housed in winter. They are fed on straw for two months of the winter, the balance on hay, roots, and meal.

GREEN FODDER.

When the pastures become dry in summer, we feed some green corn. I always think that I can get a better return of cheese from corn-fed cows in summer.

NATIVE IMPROVED CATTLE.

My cows are native stock, improved with slight strains of Ayrshire and Durham blood. Farmers are becoming thoroughly alive to the necessity of improving their stock by the use of thoroughbred male animals—several have been brought in this fall for next season's use. I have not as yet given my attention to which would be the most profitable to the farmer—beef raising or cheese making.

ADVANTAGES OF THE HOME FACTORY.

I derive several advantages from having a cheese factory on my own farm, beyond what I did when I sent my milk a distance to get it made into cheese. 1st. I save \$1 per ton for hauling milk. 2nd. I put in one extra mess of milk in the week. 3rd. I now feed my calves on sweet whey; they do well on it without any other food. 4th. My hogs are now fed on sweet whey, and each of them will (provided I keep the same number I formerly did) make 100 pounds more pork in the fall. 5th. I manage it cheaper—have my milk come in in better condition—and I flatter myself that I make better sales from having a better article to sell.

INCREASED PROFIT ON COWS.

All these considered, I now realize full \$15 per cow more in the season than I did when I sent my milk to be manufactured at the cheese factory I was running in company.

PAYMENTS FOR MILK.

I think that the system of small cheese factories is the most profitable to the community. They can be more economically managed in the first place; secondly, the profits are more equally distributed among the people, and therefore do more good. The first year that I ran this small cheese factory I paid those who patronized me 2 cents per 10 pounds of milk more than other neighbouring factories did. The next year, $\frac{1}{2}$ cent more; this season I am able to pay 1 cent more. My cows have paid me while I was making cheese this summer on an average \$38. Before commencing cheese and after stopping \$8. Total \$46. This has been a very favourable season for cheese-makers, and prices were good.

CHEDDAR CHEESE.

I understand cheese-making. This season I made Cheddar cheese exclusively. Formerly I made what was called fine American. Cheese made on the Cheddar principle presses closer, makes a more solid article, and keeps better.

[*Mr. Myers.*]

AVERAGE OF CHEESE TO MILK—CONDITIONS OF SUCCESS.

I averaged this year 1 pound of cheese for every $9\frac{1}{2}$ pounds of milk. This is something better than many others do. I attribute my success in this department to cleanliness, economy, prudence, and care in saving the milk, allowing none to go to waste; even the smallest particle, and in handling the curd, not touching it until it was in proper order, and then in not handling it so roughly as to divide it into too small particles, so that it might run off in the whey.

METHOD OF CHEESE-MAKING.

This is my mode of doing business: After the milk is weighed it is run into the vats, then cooled to about 70 degrees to take out the animal heat, then heated to 80 degrees. Then put in the rennet, leave it till it coagulates, which usually takes about fifteen minutes. Then let it stand for about one and a half hours. When it breaks off clean it is ready to cut. Then cut with a curd-knife. After cutting let it stand until the whey rises. Then cut a second time, then it is ready for cooking. Cook to about 98 degrees; then let it stand until we can see what is called "messengers"; then run off the whey. The curd then all settles down. Then cut with a common knife into chunks; the whey then all runs off. Then let it stand until the proper change takes place—the time often varies.

A CRITICAL MOMENT—TESTING THE CURD.

This is the particular time that judgment and attention are required in the cheese-maker. A neglect of a few minutes will make bad cheese. When testing it to know when it is ready to grind, by putting the curd to a hot iron and pulling it off again, it is considered good when it will string out into very fine long threads of a silky nature. Then grind fine with a curd mill; then it is ready for salting. Salt with good salt, with from $2\frac{1}{2}$ pounds to 3 pounds to the 1,000 pounds of milk. Salt evenly and put into hoops. *Press well until the whey is all out.* Put on the shelves and turn regularly, and keep the room if possible at an even temperature until it is properly seasoned.

THOMAS MYERS.

STATEMENT OF MR. JOHN GILE,

OF THE TOWNSHIP OF BASTARD, COUNTY OF LEEDS, ON DAIRY FARMING, ETC., MADE
TO MR. EDWARD BYRNE, ONE OF THE COMMISSIONERS.

MR. GILE said:—I was born in the County, and have been engaged in agricultural pursuits from boyhood to the present time. I own 750 acres of land, 600 of which is cleared and under cultivation. I pursue a general system of mixed husbandry. I grow grain largely, and have kept sheep in years past with success.

A FLOCK OF MERINOS.

The flock consisted of between 400 and 500 Merinos. Before the American war they were profitable. I used to get from 45 to 50 cents a pound for the wool; that paid well. The flock was kept well up by importing thoroughbred male animals at great cost.

FINE-WOOLLED SHEEP.

I am thoroughly convinced from experience that the Province of Ontario is as favourable a field for raising fine woolled sheep as the Northern States, and if encouragement was given to the industry, our high lands would prove useful and profitable.

[Mr. Gile.]

DAIRYING INSTEAD OF SHEEP FARMING.

Since the price of fine wool came down, I abandoned sheep raising and devoted my attention to dairying. This section of the Province is peculiarly well fitted for dairy purposes. There are over forty cheese and butter factories within a radius of twenty-five miles from my place, and the industry is rapidly growing in public favour. I own 95 cows, and expect to milk 100 next summer.

DAIRYING PROFITABLE.

I think that dairying is one of the most profitable branches of a farmer's occupation if well managed. The herd is native stock, well selected, with a view to their milk producing qualities, and improved with a small strain of Ayrshire and Durham blood.

WINTERING THE CATTLE.

We keep them housed in winter. The first two months of winter they are fed on straw, the latter part on hay and roots. We feed four times a day and water twice. There is a windmill in the barn-yard for pumping water for the cattle.

USE OF SALT FOR CATTLE.

I mix salt with the water, and always keep the troughs full of salt water. I feel confident that the cattle do better on this system than by giving salt separately. I have extensive pasturage, and don't soil any of the stock, but think that it would be profitable.

AVERAGE YIELD OF MILK.

The cows averaged this season about 3,000 lbs. of milk per cow; as a general rule large herds don't average as much as small ones, they are more liable to mishaps.

A BUTTER AND CHEESE FACTORY.

I have a cheese and butter factory combined, on my farm, for my own use, but make both butter and cheese for any patrons who deliver their own milk. When milk is delivered, we make the cheese, box it, and sell it for $1\frac{1}{4}$ cents per lb., but it is rather too little to pay. Principally, this season, we made cheese, but it is more profitable to make both butter and cheese at the same time.

PROPORTION OF CHEESE TO MILK PROFIT.

From 100 lbs. of milk we can make 10 lbs. of *full cream cheese*; this was sold this season for $11\frac{1}{4}$ cents per lb., which leaves a net profit of \$1.00 for every 100 pounds of milk.

PROPORTION OF BUTTER AND CHEESE TO MILK.

The 100 pounds of milk made into butter, and cheese makes 3 lbs. of butter and 7 lbs. of skim cheese. The butter was sold for 25 cents per lb., or 75 cents; the cheese at $8\frac{1}{2}$ cents; total $134\frac{1}{2}$ cents, from which we must deduct $3\frac{1}{2}$ cents per lb. for making butter, which leaves a balance of $24\frac{1}{2}$ cents in favour of the combined system of butter and cheese, on every 100 pounds of milk. This is what has been done this season. Our experience has been short, but we think a little better can be done when we get more conversant with the business. The cost of changing the cheese factory into a cheese and butter making establishment was about \$1,000.

[Mr. Gile.]

SYSTEM OF BUTTER MAKING.

Our system is: First set the milk in tin pails, which hold about 35 pounds, in a water pool. This pool is constructed of two-inch pine plank, water tight, 6x12 feet, 2 feet high, with a lid on hinges to shut down when required. Into this a stream of cold water is pumped, and in hot weather ice is put in to make it cooler. The water comes up to about six inches of the top of the pail. The pail is about eight inches in diameter, and twenty inches deep. It takes from 24 to 36 hours for the cream to rise.

CHURNING.

Then the cream is skimmed and churned in an upright churn. The churn is capable of churning 50 pounds of butter, and three of them are working at one time, with one shaft stroke, 18 inches to each churn. The motive power is steam. The cream is heated to 62° before churning; it takes about 40 minutes to perform the work. These churns being open at the top the maker can easily tell when the butter is coming. Before it begins to gather we put in some cold water. This gathers and hardens the butter. We partially coloured the butter this season by putting a little annato into the cream before churning.

WORKING THE BUTTER—SALTING—PACKING.

The butter is then taken out of the churn and put into the worker and washed. Ice is then put on to cool it before salting. It is then left for three or four hours, then salted with one ounce of salt to the pound of butter. The salt used is "Higgins' Brand." Then it is packed into 50 pound tubs, bandaged, a cloth put on the top and neatly covered with salt. Butter thus made has commanded the highest price in the market this season. A saving can be made by butter and cheese manufacturers purchasing annatto seed and making their own annatto.

SKIMMED MILK CHEESE.

The butter-milk, and skim milk are put into the vats and heated to 80°, then the rennet is put in, allowing it to stand 30 minutes. The curd is then cut with a curd knife and stirred a short time before beginning to cook. This is cooked to 88° and stirred, and the whey is run off. It is then allowed to stand for the acid to form, and until it flakes or threads finely with a hot iron. The curd is then ground with a curd mill, salted evenly with about 3 lbs. of good clean salt to the 1,000 lbs. of milk; then put into the hoops and pressed well until the whey all runs off. A bandage should be put on the bottom and top of cheese as well as on the sides; it would help to ward off enemies that are often troublesome in hot weather and prevent the proper curing of cheese.

CALVING—HEALTH OF CATTLE.

I have never experienced any trouble in having the cows with calf. Occasionally we have a farrow cow amongst the herd, but it does not often occur. As a rule the cows are healthy. No disease of any kind prevails in this section amongst any of the cattle.

JOHN GILE.

THE MANUFACTURE OF BUTTER, AND DAIRY MANAGEMENT.

EXTRACTS FROM A LECTURE BY CANON BAGOT.

Reported in the Irish Farmer of June 17, 1880.

Canon Bagot, in coming forward, said that some time ago, he travelled in European countries, to ascertain why they made better butter than they in Ireland did, and, therefore, obtained better prices. On the 1st January, 1880, the first Cork butter ranged at

[*Canon Bagot.*]

138s. and 143s. in the London market. On the same day the Denmark butter ranged at 141s. and 155s. On the 1st January, 1879, Cork butter was 143s. and 148s., and the Danish butter 168s., or 23 per cent. over the Cork butter.

DAIRYMAIDS—SCHOOLS IN DENMARK.

In the year 1864 and 1865 the Danish people took up the question of dairy education, and they got the Government of the day to establish schools for the education of dairymaids. They commenced this in '64 and '65, and see what has been the result that has been attained in 15 years. The effect of this education is beginning to tell; their butter has risen in price, and by competition it is over the Cork butter $2\frac{1}{2}d.$ per pound. He might, therefore, argue from that, that their success was owing a good deal to the education of their dairymaids.

COLLEGE FOR DAIRYMAIDS IN SWEDEN.

In Sweden the dairymaids were sent to a college to be educated in dairy management for six months. At the expiration of that time they got certificates which fully qualified them to act as dairymaids, and they were snatched up by gentlemen who had large dairies. These women, holding certificates, were entitled to teach other dairymaids, and for that instruction they received fees, which amounted to a first-rate salary. By serving a regular course, under a certified teacher, these women, after spending two months at the college, were themselves qualified to teach. The result of this teaching was that in those countries they made their butter of one uniform quality. Their instructions were defined as to the quality of the salt and colouring to be used in the butter, and the food to be given to cattle. In that way the quality of their butter was uniform, and that was what was beating Irish butter out of the London market. He ventured to say that if he went into their (the Irish) markets and examined superfine butter—a difference would be shown. He would find some of the firkins more salt than the others. The taste for butter in London was very fastidious. The retail dealer in London got a dozen of superfine firkins of Irish butter from the wholesale dealer. He would find that ten of them were very good indeed, but some of them were not coloured enough or had too much salt. And then he would send them back to the wholesale dealer; and the wholesale dealer says if I send the same man a lot of Danish butter, I never knew a case of where a cask was sent back. Out of 100 firkins of Danish butter no one could discover a difference in any one of them. That was one result that was obtained by the Danish people, and that we may yet attain in the manufacture of butter.

BUTTERINE.

There was a stuff called butterine, which was sold in large quantities in Dublin, so much so that it had seriously interfered with the sale of second-class butter for the past six months. The principal part was made in America and imported. It was made of the fat and the kidneys of the cow, which were melted down. They mix it up in the churn with a little butter-milk to give it a flavour, and sometimes they mix a little butter with it. He was sorry he did not bring some of it to show it to them. It was perfectly sweet and perfectly good, and if he got it on the table himself he would pronounce it to be the second-class butter. He did not object to the sale of that, provided it was pure and clean, and not sold as butter, but he thought it was a great hardship to see it substituted for, and sold as genuine butter. After some further remarks he went on to refer to the policy of

FEEDING LIBERALLY.

He wished to point out to them that it was not the cow which procured the milk—it was the food which she got produced it. The cow was exactly like a steam engine. If he got corn to thrash with a machine, he could not do so without water and coal, but

[*Canon Bagot.*]

when he was supplied with these he could go to work. The cow was a regular machine for providing milk, and it is of the food which you give her that the milk is produced. You may have a bad steam engine as well as a good steam engine—one which would require a great deal more coal than the other; and so it was with the cow, some of them will take a great deal more food to produce milk than others. His advice would be to get a description of cattle which would produce the best butter with the least quantity of food, but they might be assured that if they fed their cows well, they would be repaid by the quality of milk.

A GOOD BREED OF COWS NEEDED

Another important item which he would wish to point out was that they should be careful in their selection of cattle. They should endeavour to get cows which would not alone give them a large quantity of milk, but also keep in good condition, so that in disposing of them, they could do so with the smallest amount of loss—if loss were to come. There was a great move made of late years in improving the breed of milch cows. They could lay down no general rule as to the description best suited to this country—as the cattle best suited for Kerry may not be good for Kildare; but he thought the best breed of cattle were a cross between a Short-horn and the Dutch (Holstein).

WINTER FEEDING OF MILK CATTLE.

And now as to the feeding of cattle. In keeping winter dairies they should be careful to keep the cow also properly heated. In a cold cow-house they should have to replace by food the quantity of heat lost by the cow. That would be taking money out of their pockets as it was by food, and by that alone, the profits would be produced. They all knew of course the best kind of food to give their cattle. In Denmark he did not see a bit of natural grass—the whole country was in tillage. They grew splendid clover and rye grass, and tethered the cattle on it. Their great object was winter dairying, as they knew the butter in London was nearly double the price in winter that it was in summer. They feed their cattle exclusively at this time with clover, hay, linseed cake, and rape cake; when they send their butter to London in the winter time they get 1s. 8d. per pound for it.

SETTING THE MILK—CHURNING—THE THERMOMETER.

The speaker next referred to the system of setting the milk in Denmark and Germany. In ordinary temperature the cream would rise more rapidly in shallow vessels than in deep. The cooler the room, the deeper should be the milk in the vessels, and the warmer the room the shallower the vessels should be. Their great object should be to get off the cream sweet, before the milk was turning in the least bit sour, because you cannot make the superfine quality otherwise. In Denmark they will not churn anything but what is perfectly sweet cream, and they lay great stress upon that as being the means of enabling them to obtain such high prices for their butter. He asked two or three persons in Kerry as to how long the cream was left in the milk, and he was told about thirty-six hours. He thought they ought to change a good deal with the weather; but he might fairly say, in making superfine butter, they should have the cream separated from the milk before it got sour. In the north of France they do not mix the cream; they keep it quite separate until half-an-hour before churning. As to the proper temperature of cream when churning, he would recommend to them the use of the thermometer. They might ask him what was the thermometer for. Well, it is not dear. It is only eightpence. He called it a labour saving machine. It shows you the temperature of the cream. When the thermometer stands at 50 degrees it will take an hour and a half to churn, if it stands at 60 it takes less, and if it stands at 78 you will churn in 50 minutes, because the higher the temperature the easier the globules were broken. He thought the proper temperature in churning was from 57 to 60 degrees. He procured a thermometer for himself and gave it to his dairymaid, but she thought it was only a new fangled notion of the master's and did not use it. On last November his wife came to

[*Canon Bagot.*]

him and told him that it took the women two and a half hours to churn. He told them to use the thermometer, and the result was that, by putting the cream in a vessel into warm water and raising it to its proper temperature, the churning was done in half-an-hour, and whenever he went to Dublin afterwards he got a commission to buy a thermometer, as his servant told the farmers round about of it.

FAULTS IN SMALL DAIRIES.

As regarded churning there were two crying faults among the small farmers. Being in connection with a butter company a great deal of it passed through his hands to the London market, the faults were, keeping the cream too long without churning, which gives an unpleasant "lack" to the butter, and over-churning. With regard to letting the cream rest too long, it would be far better to make better quality by churning two or three times a week than to wait until the churn would be full and make inferior quality. The cream, when left rest too long, actually becomes decomposed like bad meat, and gives a nasty taste to the butter. The other fault was over churning. He knew that it would be the most difficult thing in the world to get the dairymaids out of that practice. The very moment the butter is formed into little grains like shot—what a dairy-maid would call cracked to—they should stop churning that very instant. If they do not they are actually injuring the butter they have made; they are destroying the quality of it, and they are putting into it the very article that they were trying to get rid of.

A MILK AND CREAM SEPARATOR.

There was one instrument which he thought would cause an entire change in the dairies of that country, and that was De Laval's separator. He saw one in Sweden dealing effectually with the milk of 4,000 cows. The milk was delivered by rail and passed into the machine which was managed by six persons. As fast as the milk passed into the machine the cream came out one spout and the milk from another. The churns were always working, and within about four hours after the milk left the cows udder, it was on its way to London in butter. It was a machine which when it came into general use would almost entirely dispense with the use of dairies. Mr. Nulty, the Roman Catholic Bishop, had got this separator which is worked by a two-horse engine, and in a report which he made he spoke in the highest terms of it. That was the only one in Ireland with the exception of the one the associated dairies of Dungarven had. There were great doubts as to whether the cream was entirely separated from the milk by this process, because, when the milk was tasted after the separator it was very good. The milk was submitted to an analyst for investigation, and he found that milk skimmed from cream in the ordinary manner contained fully $3\frac{1}{2}$ per cent. of butter fat, whereas skimmed milk obtained through the separator only contained $\frac{1}{4}$ per cent.

HOW TO HOLD THEIR OWN.

They should all try and make the best article and get the best prices for it. Canon Bagot also spoke of the injury caused to the sale of butter by putting too much water in it, and referred to a case which came under his observation of where a firkin of Irish butter sent to the London market, weighing 69 pounds, contained $38\frac{1}{2}$ of water. He thought one of the great faults in the Cork butter market was that their tasters passed the firkins with water in them in the same class as those out of which the water was taken. They should try and send on a good honest article, and if they did so the foreigner would not be beating them out of the market, and they would get better prices for their butter. If they increased the value of the butter going into the Cork market by 1*d.* in the pound it would give them something like £150,000, but there was nothing to prevent them from getting 2*d.* in the pound. If they put their shoulders to the wheel, and were careful in the selection of their breed of cattle, looked after their dairies, and kept them clean, and stopped churning at the right moment, their increased profits would almost pay the rents of their farms.

[*Canon Bagot.*]

STATEMENT

ON THE SUBJECT OF

PRACTICAL DAIRY FARMING,

FURNISHED AT THE REQUEST OF THE COMMISSIONERS,

By FRANCIS MALCOLM,

A Member of the Commission.

CHEESE DAIRYING IN NORTH OXFORD.

I have long been a resident of North Oxford, and have been engaged in the cheese dairying business, more or less, for twenty years. In that period dairy farming has made extraordinary advancement in this and the surrounding counties. One reason for this is the adaptability of this section of country for dairying, as regards water and pasture, and another reason is, that it has been found more profitable to the general farmer than grain-growing.

HINTS FOR SUCCESSFUL DAIRYING

As it is very important that so great an industry should be well understood, I will, as briefly as possible, give a few hints on the subject, the understanding and practice of which, appears to me necessary for the successful prosecution of the business. But, in the first place, I may state, that I would not recommend dairying where the conditions are unfavourable, such as where the land is hilly, and of a light porous nature, and there is a lack of abundance of water. But where the opposite of these exists, dairy farming, if well managed, may be considered a safe and profitable business.

A CERTAIN MARKET.

The fears entertained by some that it will be overdone are not well grounded. Nothing is more certain than that the cost of every production must be paid by the consumer. The question to decide is, are we in a position to compete with other parts of the dairy world? I think we are, and therefore believe there is no reason to fear.

SOIL, CLIMATE AND WATER FAVOURABLE.

As regards climate, soil and water, a large portion of this Province is well calculated for dairy farming. Therefore the business ought, and will, no doubt, extend very much further in a few years, especially in butter-making.

THE RIGHT KIND OF CATTLE.

Probably next in importance to the right kind of soil is the right kind of cattle. On this there is a variety of opinions, some favouring one breed, and some another. As I have only experience with one kind, the grade Durhams, I will give my reasons for thinking they are probably the best for this Province at the present time.

[*Mr. Malcolm.*]

REASONS FOR PREFERRING THE GRADE DURHAMS.

What is wanted, is a *short-legged, straight, smooth, heavy-bodied cow*, and also a *good milker*. I do not say that cows of another stamp may not be just as good for milk, and perhaps better, but there is a reason why I would prefer and recommend this kind of cattle. Almost every year some have to be weeded from the herd on account of some defect, or it may be desired, to some extent, to breed and raise beef cattle for the English market. In either case, with such cattle, feeding may be done with a prospect of profit. Another reason why I prefer the Durham is, because the general farmer is under the necessity of making the common cattle of the country the basis to work upon, and I think it is generally conceded that no breed surpasses the Durham in its ability to improve the stock. Among those common cattle are found the best of milkers, and by crossing such with a thoroughbred Durham bull, also selected from a good milking family, a dairy cow may be obtained of the stamp above mentioned. If not at the first crossing the process should be continued.

DURHAMS EASILY PROCURED.

Another reason for preferring the Durham is because it is the most widely spread in the Province, and therefore the most easily obtained. It is also the opinion of many practical dairymen in the United States that no breed surpasses the grade Durham for milk. In regard to their beefing qualities I might mention that last spring I sold two that had been milked for a number of years for \$128, or 5 cents per pound live weight.

YIELD OF MILK.

As regards milk, my herd of 16 will, this season, average about 6,000 pounds of milk or 600 gallons, and many others with like cattle will do similar work. However, this is a good season for pasture, and the quantity of milk is above an average.

MANAGEMENT OF A DAIRY FARM.

I will now give my opinion of the general management of a dairy farm, keeping in view the necessity for gain, and I might here say that if all the food a cow eats had to be purchased at the market price, there would be little or no profit at the prices farmers generally get for butter and cheese.

FOOD AGAINST MILK.

It will not be far from the mark, to say, that a cow that will give on an average \$40 a year will require, at market prices, \$35 in food, leaving only \$5 to pay for care and milking.

WHERE THE PROFIT IS.

But the profit is obtained, in the first place, by producing the food at less than the market price, and selling it through the cow, at the same time saving a large portion of its fertilizing value to the farm. In the second place there is a profit secured by making use of the pasturage on land not fit for cultivation, also of bulky cheap produce, such as chaff, cornstalks, turnips, etc. In fact the cow should be looked upon as a medium, or machine, by which not only the coarse, cheap, bulky, and unsaleable fodder may be turned into cash, but much that is of value, such as corn, peas, oats, barley and hay, be marketed at remunerative prices.

NEED FOR ENTHUSIASM IN A PROFESSION.

With this view of the subject, as regards the way profit is obtained, I will now speak of the general management, and while I do so it is not without the impression that dairy-
[Mr. Malcolm.]

men generally know just as well as I do what is best. The trouble is we do not practise as well as we know. What is wanted is a little enthusiasm, a love for the business, but it is difficult to keep this up with the monotony of dairying.

ONE COW OUT OF THREE PROFITABLE TO KEEP.

Every dairyman knows that the difference in cows is such, that, while one will make a good profit, others will simply pay for their keep. The Hon. Harris Lewis, a very prominent American dairyman, declared in a speech at Ingersoll, that this was about the ratio of paying cows in the United States, and most likely it is no better here.

CAREFUL SELECTION OF GOOD COWS NEEDFUL.

Now, as he said, we should endeavour to have our herds composed of *third* cows. A cow that will give 7,000 pounds of milk in a year is a cheaper cow at \$80 than a cow that gives 3,000 is at \$20. I cannot take space to figure out the difference, neither is it necessary; every dairyman knows that, while the one is a mine of wealth, the other is not worth keeping, still there are many such in the country. The only remedy is careful breeding and selection. No one can hope to get a herd of any considerable number all first class, but a continued effort in that direction may result in what might be termed good.

OPINIONS AS TO FEEDING.

But, as I before remarked, the cow is a machine for turning food into milk, and it matters not how good the machine is, it cannot work without material to work upon. Just how to feed in order to realize the largest profit is a question on which there is a diversity of opinion. Some think it pays to feed corn, bran, and chop stuffs. Others are of a different opinion, but are satisfied with a smaller quantity of milk, if it is made from unmarketable produce and pasture; almost everything is sold that will bring money, except hay, and a few will go even the length of selling that, to such an extent at all events, that the cows are simply kept in a *living* condition.

NECESSITY FOR LIBERAL DIET.

Now those who feed beef cattle, know, that, if they do not give their cattle more than what will merely supply the requirements of life, they will never make beef, and it is just so with cows; it is the extra food over and above what is actually required to keep the machine in working order, that can be turned into milk. The dairyman that is afraid to put in this extra for fear he will never see it again, is like a miller that after being at the expense of building a mill is afraid to buy wheat to grind in it. As far as theory is concerned, one would think that if all the profit is derived from the extra food, the more of it the better. But to judge from the practice of many, it is evident they are unbelievers.

METHOD OF FEEDING.

I will now briefly give my own practice, and leave it with the reader to judge whether it be good or bad. As soon as the cows are put dry—which is usually about Christmas—they are put upon straw, chaff, and a little hay, with a feed of cut turnips morning and evening. If I have abundance of straw I do not cut it, but prefer to allow the cows to select the best, which they cannot do if it is cut. What they leave is used for bedding, and so worked into manure. I endeavour under this treatment to improve their condition, and therefore, if any are very thin in flesh, they are fed something more nourishing.

A GOOD CONDITION IN JANUARY AND FEBRUARY THE GREAT OBJECT.

In fact I consider it the backbone of successful dairying to get the cows up in fine [Mr. Malcolm.]

condition in January and February, and if one kind of food won't do it, recourse must be had to another more nourishing. I have no certain rule to go by in feeding either this or that; it will all depend on their condition and time of calving.

THE CALVING PERIOD.

As they near that period I increase the rations of the more nourishing food, as the growing calf is a heavy drain upon the cow. When they do calve they are fed more or less chop grain twice a day, mixed generally with wheat-bran and all the good hay they will eat. At the same time I keep up the turnip feeding, and if I have a good supply I increase the quantity.

PUTTING TO GRASS.

They are brought upon the grass gradually, a sudden change having a tendency to make them too loose in their bowels. Through the latter half of May and the greater part of June, pasture is generally very abundant and nothing else is needed, and in fact so long as pasture is good, it is quite sufficient, but when it begins to fail, the cows must be fed or fall off in milk.

A COMMON BUT BAD PRACTICE.

The general practice is, to let them take their chance, and the owner the consequences, till fodder, corn, or after-grass can be obtained. The falling off is generally so serious, and impossible to restore for that season, that I concluded last summer to try bran.

BRAN AS SUMMER FEED.

I commenced on the 20th of June and fed bran till about the middle of September, when abundance of corn took its place. I put them in the stable morning and evening after milking, and fed each about three pounds. This did not keep them up to a full flow of milk, but unquestionably it did to such an extent as paid well for the bran. There was also the manure of the barn, mostly left on the pastures, and I am not sure but that the extra condition of the cows would not be an equivalent to the value of the bran.

COST OF BRAN PER COW.

They eat about \$4 worth each, and I am quite certain they are from 50 to 100 pounds heavier than they usually are in November, this would be worth at least \$3 each, but as pasture was good this year I cannot say just how much their condition is attributable to the bran. After the hay was cut, they were fed a little in addition to the bran, but some would not eat it. The bran was fed dry. This was attempted partly by way of experiment, and I am very well satisfied with the results.

FODDER CORN—MANGOLDS.

Fodder corn is perhaps the most reliable green food for August and part of September; then to have a piece of mangold for October and November is good practice, but whatever it be, the most economical dairying is liberal feeding.

WARM AND WELL VENTILATED STABLES.

Another important matter is comfortable, well-ventilated stables. A certain amount of heat must be kept up, if this is not attained by good walls, the cow uses the food she eats for that purpose. If those that are behind in this matter could only see their animals burning their food in order to keep warm, they would open their eyes to the importance of a good stable, and would, no doubt, soon procure one. It is now becoming very common to build such stables as a basement under the barn. They are cheap, convenient, and in every respect answer the purpose admirably.

[*Mr. Malcolm.*]

PROFITS OF A COW PER ANNUM—TIME OF CALVING.

The profits from a cow in the course of the year will depend very much on her *time of calving*. It is a very common occurrence in a dairy herd for one cow to make \$10 or \$12 in the spring before another one calves. I prefer to have them calve in March or beginning of April. If it is desired to raise the calves, any time in the winter is good, there is then a chance to feed the calves milk for several weeks before the factories start, and by getting in this way a very early start in the spring, the calf, if a heifer, may, and ought to be herself brought to milk at two years and two months.

FEED WELL FOR THE FIRST TWO YEARS.

My reasons for thinking and practising this, that I believe it better economy to feed well the first two years than half feed for three. It is also thought by many that they make better cows; there is a danger if they get fat the third year, that it will develop that tendency at the expense of the tendency to milk. So much am I in favour of bringing them to milk at two, that I would not raise a heifer if I knew she would not milk before she was three. I believe in cows milking, not only early in years, but at least nine months every year.

REGULARITY IN MILKING.

In regard to milking I would only say that it should be done with great regularity, and the time as evenly divided as possible, especially when the flow is large. It is also good practice for the same persons always to milk the same cows, and in the same order.

CLEANLINESS INDISPENSABLE—BAD ODOURS VERY MISCHIEVOUS.

I have not space to speak of the necessity for cleanliness in milking, but here is where the great danger from impurities lies, and not only from actually filthy material, but from offensive odours in stables. It is utterly impossible to bring pure milk from a rank-smelling stable. Nothing will absorb those odours quicker than warm milk; great care should therefore be taken to ventilate before milking, and to remove the milk as quickly as possible to pure air.

KIND TREATMENT IMPORTANT.

A great deal might be said on the *general treatment* of cows, but my remarks are already too long. Sufficient to say that, after comfortable stabling, liberal feeding, and abundance of good water, kindness should rule. No kicking or clubbing, no driving with dogs. Everything should be done to keep the cows placid and quiet. All excitement will reduce the quantity of milk and otherwise injure it. Every cow should be a pet, that will not step out of your way, but require you to go round. A little patting, stroking, and currying I believe will pay. But as I said before, we don't practise as well as we know.

CARE OF MANURE.

The manure from a herd of cows is an important affair, and should be cared for, both solid and liquid as far as possible. Much of the profit of the dairy will depend on how this is done. But as I expect the manure question will be fully discussed by others, I leave it at present.

F. MALCOLM.

[Mr. Malcolm.]

ONTARIO AGRICULTURAL COMMISSION.

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